

# Dental Digest

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# Dental Digest

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Doctor Roberts has published approximately 30 articles dealing with a wide range of subjects related to diagnosis and treatment. He is the author of a book, "Difficult Diagnosis: A Guide to the Interpretation of Obscure Illness," and of a second soon to be issued by W. B. Saunders Company, "The Great Mimics in Modern Medical Practice." He has been a teacher and is now actively engaged in research concerning the management of

diabetic retinopathy, control of hemorrhage in diverse clinical disorders, effective long-term weight reduction and the management of brain-stem infarction. Doctor Roberts' article, ESTROGENIC CONTROL AND PREVENTION OF BLEEDING AFTER DENTAL EXTRACTIONS DURING LONG-TERM ANTICOAGULANT THERAPY, first appeared, in somewhat different form, in the Journal of the American Medical Association.

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# Management of Extraoral Facial Abscesses of DENTAL ORIGIN

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## DIGEST

*This article is a definitive discussion of the clinical management of extraoral facial abscesses. The two avenues in which treatment is directed, (immediate surgical intervention for relief of inflammation, and continued supportive therapy to encourage postoperative recovery) are described in detail.*

## General Considerations

Many extraoral abscesses of the face and neck region are of dental origin. Differential diagnosis is of great importance, since some of the conditions which simulate odontogenic infections are neoplasms, salivary stones, cysts, actinomycosis, tuberculosis, and adenopathies. Fortunately, an infection of

Author's Note: The illustrations for this article were made by H. S. Verdi.

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Fig. 1—Clinical photograph showing undesired dimpling scar on the right side of the face as a result of incomplete treatment.

Fig. 2—Photograph of a patient shows extraoral facial fistula of odontogenic origin.

dental origin is usually diagnosed readily.

*History of Toothache Typical*—A complete history should be obtained

from the patient; from this a tentative diagnosis can be made. Typically, the history reveals that the patient had a severe toothache or recurrent tooth-



Fig. 3 (left)—Local anesthesia is administered by injecting the anesthetic drug into the normal tissue around the point of incision and drainage.



Fig. 4—The skin incision should be made to a length of 1/4 inch at the periphery of the abscess, where the skin appears normal.

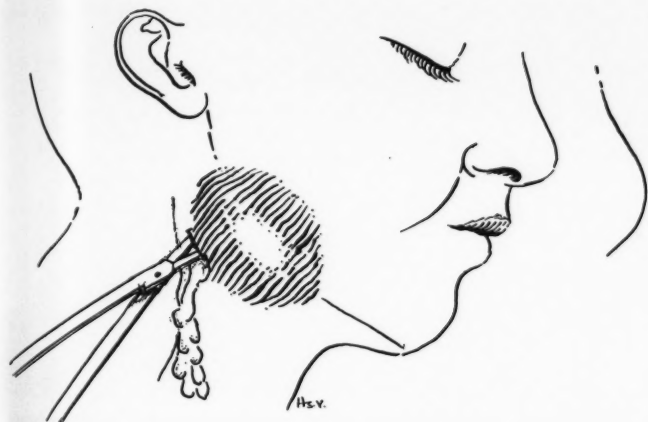


Fig. 5 (left)—A surgeon should open the various loculi, carefully and gently to avoid injury to the vessels and nerves while allowing the entire area to drain by using a curved hemostat.

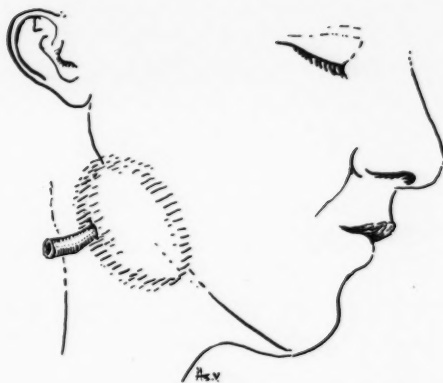


Fig. 6—A nonabsorbent drain or Penrose rubber drain should be inserted into the evacuated space to establish adequate drainage.

ache in the past, now probably having subsided, with swelling within twelve hours. The offending tooth can frequently be determined simply by clinical and radiographic examination.

**Common Symptoms** — (1) Clinically, there is a temperature elevation and general malaise due to fever; lymphadenitis, malocclusion, dehydration, loss of sleep, inability to eat, and asymmetry of the face.

(2) The patient may or may not complain of pain at this time, depending upon whether or not some avenue of drainage has been established.

(3) Pain usually persists while the infection invades the bone under the

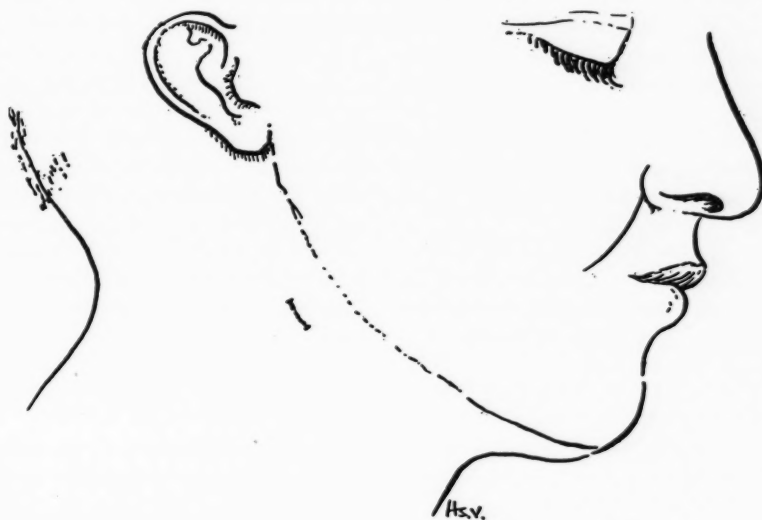


Fig. 7—Diagram shows results of surgical intervention. Note that healing will take place by first intention with minimum undesirable scar formation.



Fig. 8—Poultices of all kinds should be avoided. It has been found that poultices delay healing and incite more scar formation.

periosteum and is minimized as it enters the soft tissues.

(4) Pointing, or even fluctuation, may also be present. Other local symptoms depend on the extent of the inflammation and the type of tissue involved.

**Radiographic Examination** — Radiographically, a tooth may reveal evidence of a carious lesion with apical rarefaction, or no evidence of disease so far as the bony investing structures are concerned.

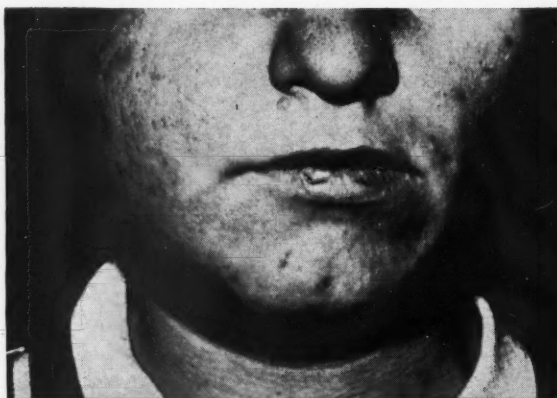
**Laboratory Studies**—These should include routine blood, urine, and bacteriologic tests.

**Principle of Treatment**—In general,

treatment can be divided into (1) surgical intervention, and (2) supportive therapy. In this article the authors discuss clinical management of extraoral facial abscesses. The step-by-step surgical technique employed is described.

### Surgical Intervention

By surgical intervention is meant evacuation of pus by incision and drainage and removal of the underlying cause. Once the presence of pus has been diagnosed, it must be evacuated as soon as possible so that healing can take place by first intention with minimum undesirable scar formation. It



**Fig. 9 (left)**—Preoperative clinical photograph shows a large extraoral facial swelling over the right mandible causing asymmetry of the face.

**Fig. 10**—Side view shows extension of the swelling to the level of the ear and down to the submaxillary area.

has been found in untreated cases that abscesses may continue to spread until the skin or mucous lining of a cavity is penetrated and pus is evacuated. The wound then heals either by second intention, that is, fibrosis occurs resulting in undesired dimpling scars (Fig. 1) or extraoral draining fistulas and sinuses (Fig. 2).

**Surgical Instruments Required**—The surgical instruments and supplementary materials needed for incision and drainage are the following:

1. Sterile gloves
2. Scalpel (Bard-Parker Blade No. 11 or 15)
3. Curved hemostat or sinus forcep
4. Sterile gauze; 4-inch by 4-inch
5. Penrose rubber drain
6. Syringe with hypodermic needle
7. Local anesthetic

8. Suitable extraction dental forceps and elevators

9. Sterile towels

**Anesthesia**—Since most patients are ambulatory during treatment, local anesthesia is preferred. Ideally, however, the operation should be undertaken under general anesthesia. Experience has shown that adequate anesthesia can be obtained without complications in an inflamed area by administering a local anesthetic. The provision that a local anesthetic should never be injected into inflamed tissues for fear of disseminating the infection is debatable.

**Operative Procedure**—a) Prepare the operative field and scrub with soap and water and finally with alcohol. Drape the patient with sterile towels.

b) Administer local anesthesia by

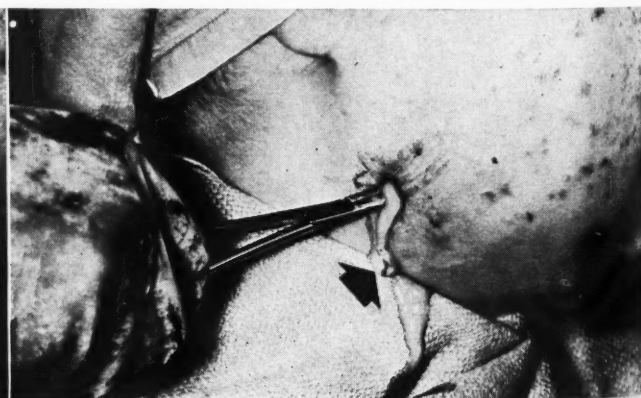
injecting the anesthetic into normal tissue around the point of incision and drainage (Fig. 3).

c) If the skin over the center of the abscess is thin and taut and shows signs of skin necrosis, the incision should not be made at this point. Instead, it should be made at the periphery of the abscess where the skin is normal (Fig. 4).

d) The incision should be made in cleavage of lines of Langer with a No. 15 Bard-Parker Blade (Fig. 4).

e) The incision must be clean, and direct and must penetrate the entire thickness of the skin at one stroke and at even depth along its entire length.

f) The incision should be made at right angles to the surface of the skin in order that the skin edges may meet perpendicularly when healed and it



**Fig. 11 (left)**—Administration of local anesthetic by using 1.5 per cent Primacaine® to anesthetize the skin and subcutaneous tissues where the instrument for incision and drainage is to pass.

**Fig. 12**—Opening of abscess by a curved hemostat. Note evacuation of white, creamy purulent material which is collected for culture and sensitivity tests.



should be  $\frac{1}{4}$  inch long. This is sufficient to obtain free drainage (Fig. 4).

g) The superficial and deep facial layers and muscle fibers should be separated by blunt dissection. By separating the blades of a curved hemostat, the surgeon can open the various loculi, carefully and gently to avoid injury to the blood vessels and nerves while allowing the entire area to drain (Fig. 5).

h) After the abscess is opened and the cavity explored, all obvious sloughs should be expressed. A culture and sensitivity test should be made on the pus to determine the antibiotic to which the invading organisms are sensitive (Fig. 5).

i) Careful flushing of the abscess cavity with sterile physiologic saline solution at the conclusion of the operation is recommended.

j) A nonabsorbent drain or Penrose rubber drain should be inserted into the evacuated space to ensure adequate drainage. Drains should not be sutured to the skin; instead a knot should be made at one end of the rubber tube which is placed deep into the incision; this prevents it from slipping and eliminates suture scarring. The drain must be removed within twenty-four to seventy-two hours after incision and drainage (Fig. 6).

k) The wound area should be covered with a sterile (4-inch by 4-inch or 2-inch by 2-inch gauze) dressing to prevent contamination from secondary organisms. It is often necessary to apply the dressing with some pres-



**Fig. 13—A Penrose drain is in place to establish adequate drainage and a knot is made to ensure stability of the drain.**

sure as it is usual for an abscess cavity to ooze a considerable amount of purulent material and blood serum immediately after opening. The dressing should be changed twice or three times a day, depending upon the amount of exudation.

l) Extraction of the offending tooth during the acute attack of inflammation will depend upon the general condition of the patient and will also require considerable clinical judgment and experience.

The object of surgical intervention is to provide an immediate outlet for accumulated pus so that healing can take place by first intention with min-

imum undesirable scar formation (Fig. 7).

### **Supportive Therapy**

Supportive therapy means treating the patient as a whole to build up his immunity. This includes the application of thermal agents, proper administration of antibiotics and chemotherapy, sedation, diet, elimination of toxic elements, rest, necessary medication, and general nursing care.

a) *Application of Thermal Agents*—Intermittent application of hot, moist compresses over the area extraorally and hot salt gargles are of prime importance and will accelerate wound



**Fig. 14 (left)—Photograph taken on the fourth postoperative day. The extraoral facial swelling had completely subsided. Drain is to be removed at this time (white arrow).**



**Fig. 15—Final photograph taken 3 months later. The patient who had remained asymptomatic to date shows normal symmetry of the face.**

healing. *Poultices of all kinds should be avoided.* It has been found that poultices delay healing and encourage scar formation (Fig. 8).

b) *Proper Administration of Antibiotics and Chemotherapy* — Intelligent use of antibiotics as determined by culture and sensitivity tests are necessary to prevent extension of the infection. Antibiotics are continued until the patient's temperature and white count are normal.

c) *Adequate Hydration and Diet* — The most common sign seen in inflammatory disease is dehydration. This increases the possibility of complications and delays recovery; the patient should, therefore, be properly hydrated as soon as possible. In certain instances, Dextrose 5 per cent and salt solution should be given intravenously. Patients are usually in a poor nutritional state because of inability to swallow due to pain and edema. A diet high in protein and vitamins is therefore important to build up resistance.

d) *Sedation and Rest* — Drugs to relieve pain and induce sleep should be prescribed (analgesics, antipyretics, and hypnotics). Tension induces severe pain which may lower the patient's power of resistance.

e) *Elimination of Toxins* — Daily evacuation is essential. Kidney action is increased both by the quantity of fluids introduced into the body and by the use of diuretic drugs.

### Case Report

The following case is one of a series which illustrates evaluation of an extraoral facial infection of dental origin and its management.

*Chief Complaint* — A 28-year-old white woman was first seen in the emergency service of the Research and Educational Hospitals complaining of a painful extraoral facial swelling of ten days' duration, accompanied by an earache in the right ear.

*History* — The condition probably started with a toothache in the right lower third molar. The toothache had occurred about six months before the patient was seen and lasted two days. The patient used emergency toothache drops as home treatment. The lymph nodes in the right submaxillary region were swollen several times in connec-

tion with colds, but the swelling had not been so painful nor so large as now. There had been no discoloration of the skin.

A juvenile acne of the face was noted. She had had measles and mumps and lobar pneumonia twice, in the past four winters. The patient was allergic to sulfa drugs.

*Results of Examination* — A large localized, reddened, fluctuant tender swelling over the right mandible was revealed. The swelling was warm to touch. It extended up to the level of the ear and down into the submaxillary area (Figs. 9 and 10).

*Oral Examination* — A carious lesion in the right lower third molar was tender to percussion. The patient also had many other carious teeth. Most of the molars had been extracted in childhood.

*General Symptoms* — The patient appeared to be febrile with slight dehydration. She did not have marked trismus and could breathe easily. The general physical examination, including ears, nose, and throat was essentially normal.

*Radiographic Examination* — X-ray examination showed a markedly carious lesion and periapical changes at the right lower third molar. The chest x-ray results were negative.

*Laboratory Data* — Routine urine and blood studies were essentially normal except the white cell count which was 12,700.

*Tentative Diagnosis* — The tentative diagnosis was extraoral facial submaxillary and buccal space abscess of dental origin.

*Treatment* — Since the patient was ambulatory, it was decided to incise and drain the facial space abscess extraorally and extract the right lower third molar under local anesthesia. The patient was given Combiotics® antibiotics (400,000 units of penicillin and 0.5 grams of Streptomycin intramuscularly daily) every day for five days as a prophylactic measure. (In the interim it is wise to use "shot gun" therapy; that is, to administer the antibiotic most likely to be effective in preventing further spread of the infection.)

*Operative Procedure* — 1. After the

usual preparation of the face, local anesthesia (Primacaine® 1.5 per cent) in the form of subcutaneous infiltration was administered below the angle of the mandible (Fig. 11).

2. An incision was made through the skin, after which a curved hemostat was inserted into the submaxillary and buccal spaces (Fig. 12). About six ounces of white, creamy foul pus was evacuated and a sample was sent for bacteriologic study and sensitivity test.

3. A Penrose tube was inserted into the abscess and maintained by a rubber tube knot (Fig. 13).

4. A dry dressing, 4-inch by 4-inch gauze, was applied.

5. Under closed mouth mandibular nerve block because of partial trismus, the right lower third molar which had a large, periapical infected granuloma was extracted.

*Postoperative Treatment* — (1) A hot wet dressing was applied over the right side of the face, covered with oil-skin held in position with an Ace bandage, (2) sedation, Empirin® compound No. 3, was given every four hours for pain, (3) Nembutal® 100 milligrams, one capsule at bed time, (4) oral rinses with warm salt water, (5) high calorie fluid intake orally, (6) complete bed rest, and (7) antibiotic therapy instituted on the day of operation and continued four days.

*Progress* — (1) Cultures made from the pus showed moderate non-hemolytic streptococci and alpha hemolytic streptococci.

(2) The patient was seen on the next day; the pus was still draining. On the fourth postoperative day the swelling had completely subsided and drainage had ceased (Fig. 14). The drain was removed; the white cell count was 6,900.

(3) The patient was discharged from the clinic and was seen two weeks later. The area of incision had healed satisfactorily and the swelling had resolved. The hot packs were discontinued.

The patient was seen three months later. Figure 15 shows the patient who had remained asymptomatic.

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## Direct - Indirect Technique

### FOR MULTIPLE INLAYS AND FIXED BRIDGES

R. H. KILLEBREW, D.D.S., Des Moines, Iowa

#### DIGEST

*It is generally agreed that a direct wax pattern of a cavity or crown preparation results in a better fitting restoration than one completed by the indirect method. With the technique presented in this article the advantages of both the direct and indirect methods of making multiple inlays and fixed bridges are combined.*

#### Procedure

The following steps may be taken:

(1) An impression of the teeth in alginate is taken before the preparations are started. (This impression is to be used later for making the temporary acrylic restoration.)

(2) The preparations should be made with shoulders.

(3) Adjust a "buckle matrix" loosely around the teeth prepared for inlays. Use over-sized festooned copper bands cut short of occlusion for ir-

regular cervical margins and crown preparation.

(4) Individual wax impressions are made of each preparation. Fill the band with inlay wax, soften it thoroughly with a hot spatula, force into position in the mouth and have the patient close in centric. Chill with cold water held in the mouth.

The excess wax forces the tissue away from the margins. This eliminates the necessity of a gingival pack.

(5) Withdraw the wax impression from the tooth and remove the band. Cut away excess wax around the gingival margins with a razor blade. Return the pattern to the tooth and cut off the bulk of excess wax. Outline the margins with a hot spatula. Relieve interproximal wax so that it will not touch the adjacent pattern. Do not carve the patterns. Put aside each pattern until all are completed.

(6) Place the wax patterns on the respective teeth. Number 2 carpet tacks that have been cut off half way

to the heads are heated and stuck into each pattern. Two or more tacks are used on large wax impressions. (Fig. 2).

(7) Cold water is used to make a soft mix of alginate. Fill a suitable perforated tray with the cold alginate. The tray should be filled to the level; if it is filled excessively the wax patterns will be displaced.

After the wax impressions are seated in position carefully insert the tray vertically. Do not shift the tray. The patient is instructed to close gently until the opposing teeth touch the tray. The patient can hold the tray in place without shifting it much better than the operator (Fig. 3). The alginate is allowed to set thoroughly, then slowly removed. The heads of the tacks are incorporated into the impression material, therefore when the wax patterns are removed the impression is in correct relation with each other.

(8) An impression is taken of the opposing teeth and a bite is made.

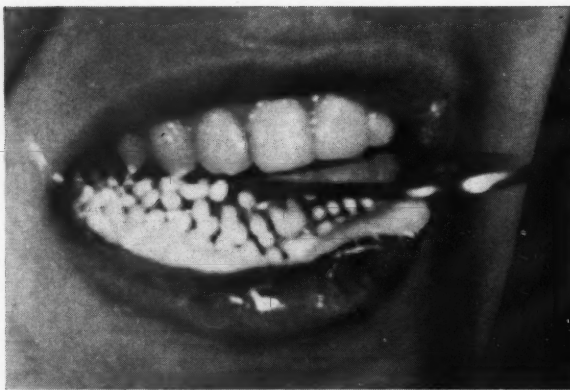


Fig. 1—Shows teeth before alginate preparations are made for a three-tooth bridge.

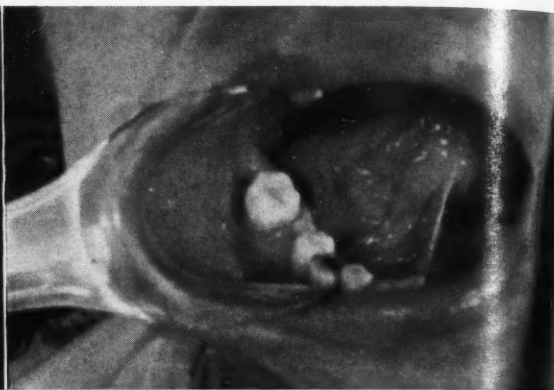


Fig. 2—Inlay wax impressions are made of each prepared tooth. Carpet tacks, with the heads painted white to show in illustration, are warmed slightly and stuck into each pattern.





**Fig. 3**—The patient closes gently on the tray as the impression is made. He can hold the impression in place during setting time more successfully than the operator.



**Fig. 4**—Temporary restorations are made by placing quick setting resin in the original impression of unprepared teeth. Carefully reset the impression in place and have the patient close firmly on the back of the tray until the resin is set.

### Temporary Restorations

For this technique the original impression of the unprepared teeth is dried and the interproximal impressions are cut out from the teeth not involved. The following steps may then be completed:

- (1) Lubricate the prepared teeth.
- (2) Mix a suitable amount of cream colored quick setting acrylic and fill the impressions of the teeth that were prepared.
- (3) Carefully replace the impression on the teeth and hold firmly in place.
- (4) Holding an extra portion of the acrylic in the fingers enables the operator to tell when it has set in the mouth.
- (5) Remove the impression leaving a reproduction of the tooth in acrylic.

(6) Trim off excess with an instrument and smooth rough edges with a dull high speed bur.

(7) The temporary restoration can be removed and recemented with zinc oxide if desired.

### Laboratory Procedure

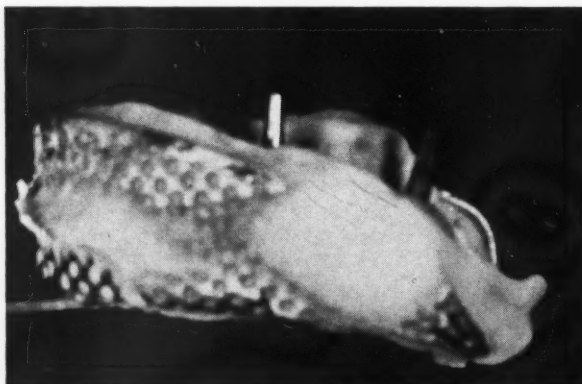
- (1) Separators of .002-thickness matrix material are placed between each wax pattern that is incorporated in the alginate impression.
- (2) Paint the inside of each pattern with debubbler.
- (3) Vibrate die stone into the wax impressions until it reaches the top edges of the separators.
- (4) Place dowel pins.
- (5) Apply separating media to the hardened stone.
- (6) Round pieces of wax are attached to the apex of each dowel pin.

- (7) Pour the base with Castone.®
- (8) The cast will separate with the wax patterns in place.
- (9) Carve each wax pattern.
- (10) Invest and cast.

### Full Crown Construction for Single Crowns

In cases where a single gold crown or veneered crown is needed it can be made quickly and accurately by the following procedure:

- (1) If the tooth is badly broken down, build it back to its normal anatomy with red utility wax. Where the tooth acts as an anchor for a partial prosthesis, place the partial in position and have the patient close gently in occlusion. This will make an impression in the utility wax of the rest lug after the partial is carefully removed.



**Fig. 5**—Vibrate die stone into the impressions. Round pieces of wax are stuck to the apex of each dowel pin for easy access after the base is poured.



**Fig. 6**—The case is separated from the impression with wax patterns in place.



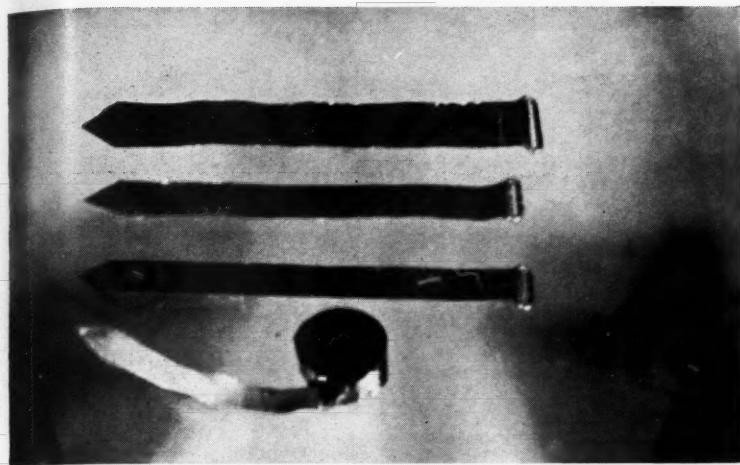


Fig. 7—Belt buckle matrices are used to make individual inlay wax impressions of each preparation. Fit the matrix loosely around the prepared tooth, fill with inlay wax, melt it with a hot spatula, and force it into place. Have the patient close in centric and chill the wax with cold water. Remove the impression with the matrix and unbuckle band. Trim off surplus wax with a sharp knife.

(2) Fill a perforated half tray with alginate impression material and place over the tooth to be crowned. Have the patient close onto the tray and hold the pressure until the impression material has set thoroughly. Remove the tray vertically and examine to see that an accurate impression of the tooth to be crowned has been obtained. The impression is then set aside and kept damp until the crown preparation is made.

(3) Dry out the impression with air and remove all the interproximal sections except the ones adjacent to the prepared tooth. This makes it possible to reset the impression on the teeth accurately without interference of the interproximal sections folding on themselves which would provide inaccurate seating. The preparation is thoroughly dried with air and a thin coating of utility wax is melted over the preparation.

(4) A small amount of quick setting acrylic is mixed and placed in the impression of the tooth to be crowned. The original impression is then resealed on the teeth and the patient is instructed to close just hard enough to hold the tray in place. The patient is able to hold the impression in place much better than the operator. A small piece of the acrylic is retained to test

the setting time. After it is set, remove the impression thus leaving an acrylic crown that is a replica of the original tooth.

(5) The acrylic replica will withdraw easily from the preparation due to the coating of the utility wax previously placed on it. The excess acrylic is removed from the crown. Ream out the crown with a round bur.

(6) Acrylic shrinks, therefore an accurate impression of the prepared tooth with acrylic alone cannot be relied upon. The reamed out crown is filled with inlay wax and melted to a liquid with a hot spatula. Replace the crown on the prepared tooth and have the patient close in occlusion. Cool with cold water and remove excess wax with a warm spatula.

(7) If the tooth is an anchor of a partial, the partial is placed in the mouth before the wax core has hardened to ensure proper relation to the clasps and rest. If a veneer is desired, the window is cut out while the tooth is on the preparation. The depth is determined when the wax core is reached.

(8) Remove the acrylic crown with the wax core and place sticky wax on the spot for sprueing; use a large sprue. It is a good plan to add extra wax on the contact points to compensate for polishing. Invest and cast.

## Advantages of Technique

- (1) More accurate restorations can be made.
- (2) It is unnecessary to pack the gingival margin.
- (3) No more equipment than is found in the average office is required.
- (4) The finished restoration needs little occlusal adjustment.
- (5) No assistance is needed.
- (6) Dies do not have to be waxed.
- (7) After a little practice, less time is consumed with this technique and better results are obtained.

## Summary

After ample experience with the technique described the author has had more accurately fitting restorations, and fewer occlusal adjustments have been necessary.

The laboratory technician does not have to locate the gingival margins by guess; the inlay wax forces the tissue away from the prepared margins so that visibility is improved.

The bite is registered in each wax pattern when taking the individual wax impression.

Proficiency in the direct-indirect technique saves time and provides better results.

712 Equitable Building

Author's Note: The buckle matrix referred to is supplied by Iowa Dental Supply, Des Moines, Iowa.

## ADDRESS CHANGES

When you change your address, please allow six weeks for your notice to use to become effective. Always include old address with new address. Your postal zone number should be shown as this not only helps the post office but speeds delivery of mail. Send address changes to: DENTAL DIGEST, 1005 Liberty Ave. Pittsburgh 22, Pennsylvania.

# STAINLESS STEEL CROWNS

## and the Child Patient—Part Two

DUANE A. SCHMIDT, D.D.S., Fort Dodge, Iowa

### DIGEST

*In this installment which is the second of four articles on the subject of stainless steel crowns applicable to the child patient, the author discusses the problem of maintaining space where teeth have been lost from caries or trauma. Step-by-step directions are given for completing procedures effective in solving this important problem.*

### Crown Selection for Space Maintainers (Five Minutes)

For the first step in preparing a space-maintainer refer to the technique for the stainless steel crown preparation. (A stainless steel band may be used in lieu of the stainless steel crown.) The assistant prepares the bracket table, spot-welding and soldering equipment while the crown is selected and fitted.

Cut and contour the crown, pressing it into occlusion, and leave it on the tooth temporarily.

### Spacer Bar Preparation (Two Minutes)

When this technique is learned it becomes possible to construct custom-made spacer bars in a matter of seconds. (If preferred, preformed spacer bars are available.)

**Materials Required**—A length of .032 round arch wire, 53G optical pliers, and wire cutters is all that is needed for constructing the bar.

**Procedure**—1. Grasp the wire with the pliers, squeeze to place the first bend and bend down the two ends of the wire.

2. Place a bend in the blunt end of the bar to conform with the buccolingual curve of the ridge.

3. Place bends in the long sides of the bar to conform to the mesiodis-

tal curve of the edentulous ridge.

### Fitting and Spot Welding (Three Minutes)

1. Holding the spacer bar in place in the mouth make a vertical mark with a red pencil on the crown and the spacer bar at the point where they meet. Remove both the crown and the spacer bar being careful not to erase the red marks.

2. Refit the crown and the bar on the copper electrodes of the spot welder. Spot weld on one side only; usually the buccal. Gently fit in place in the mouth. It is usually necessary to nudge the spacer bar into proper alignment being careful not to break the spot-welded joint.

3. Remove the appliance and spot weld the joint of contact on the lingual.

### Soldering Procedure (Five Minutes)

1. Invert one copper electrode so

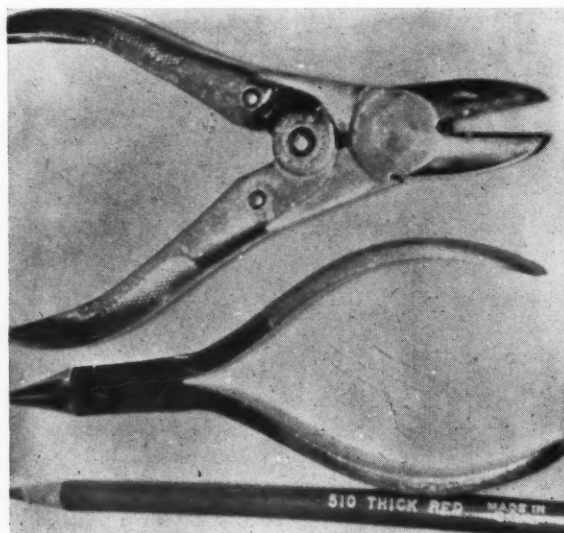


Fig. 1—Additional armamentarium for space-maintainer construction showing: wire-cutters, optical pliers (No. 53G), red marking pencil, and .032 round wire.

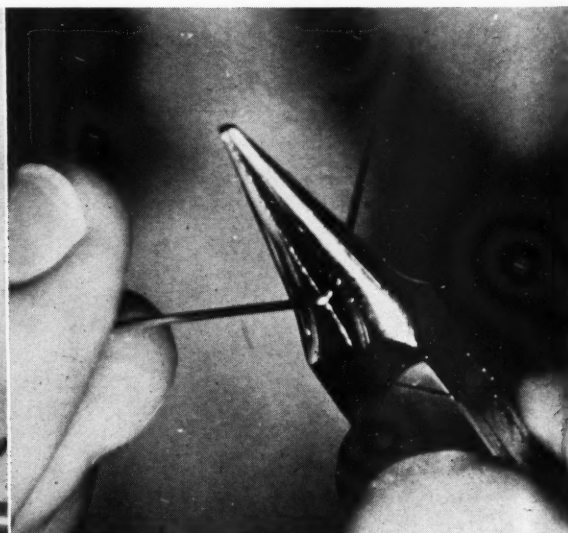
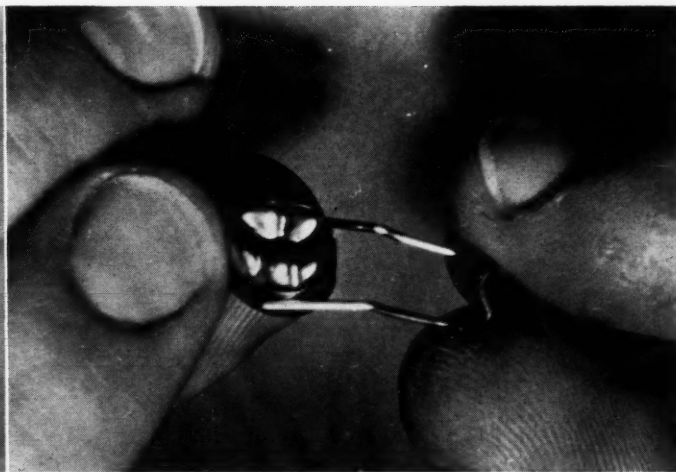
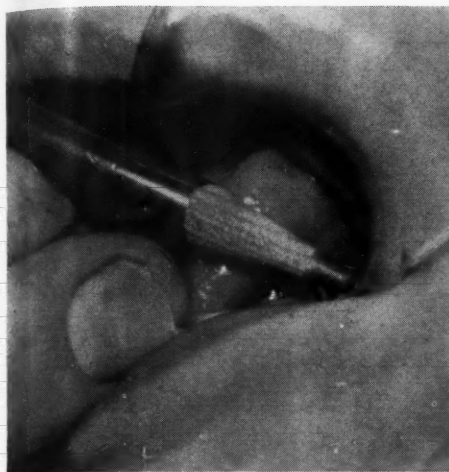


Fig. 2—Bending the round wire to form the spacer bar.



**Fig. 3—**Marking the juncture between the crown and the spacer bar with the spacer bar in place. The two will be joined with spot welding at this mark.

**Fig. 4—**Joining the two parts of the space maintainer for spot welding.

that the carbon tip is in position.

2. File the carbon with an emery board and freshen the copper tip with a small metal file.

3. Add flux to the spot-welded joint; place a piece of bar solder on the flux; and solder.

4. Cool in water, dip, and repeat on the opposite joint.

#### **Polishing the Spacer (Three Minutes)**

1. Remove the bulk of the metal with a carborundum wheel on a dental lathe.

2. Contour the solder joint with a

carborundum stone on a straight hand-piece.

3. Polish with burlew disc. Buff to a high polish on the lathe with a rag wheel and tripoli.

4. Clean the spacer with soap and water.

#### **Tooth Preparation**

If tooth preparation is needed the assistant may be trained to polish the solder joints as the tooth preparation is completed. If this is not necessary proceed to cement the spacer.

#### **Cementing and Cleaning (Four Minutes)**

1. Dry the tooth as the assistant begins to mix the cement.

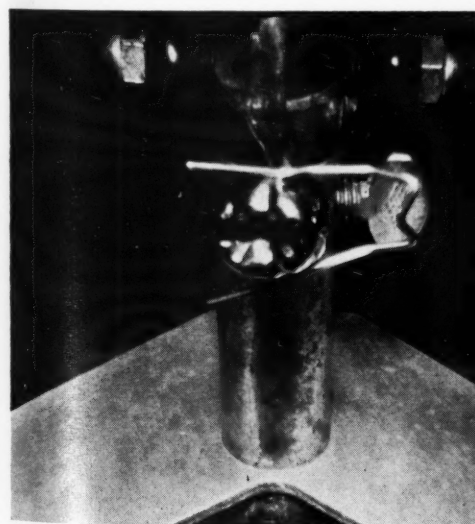
2. Press to place with a band pusher.

3. Correct the occlusion by firmly pressing the lower jaw against the upper.

4. Allow the cement to set, then remove the flash.

#### **Other Types of Space Maintainers**

A one-appointment spacer has been discussed. The time needed for this operation is not prohibitive even for the small patients. Approximately half an hour is all that is allowed on the



**Fig. 5—**Spot welding the joint.

**Fig. 6—**Retrying the newly spot-welded appliance in the mouth for proper positioning.



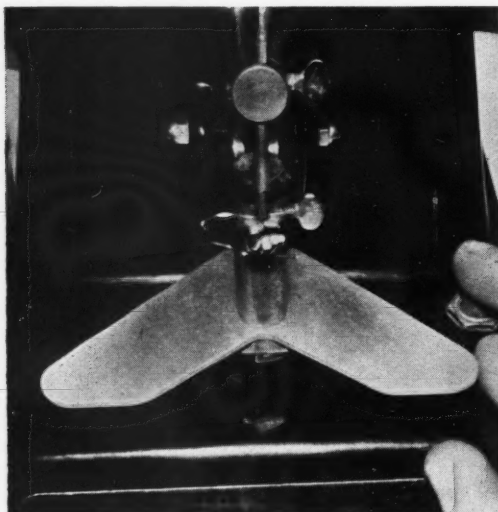


Fig. 7—Soldering the joint.

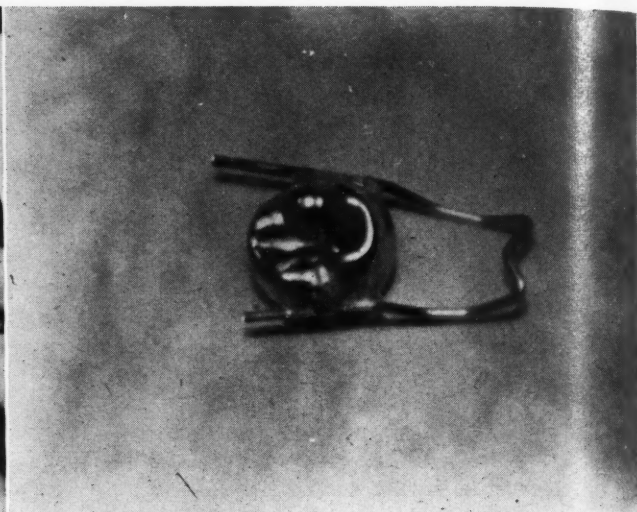


Fig. 8—Space maintainer newly soldered at both joints.

schedule. Most of the procedure is completed outside of the mouth so that the time spent on the patient is minimal.

Sometimes, however, circumstances necessitate making impressions and sending the work to the laboratory. The chair time in this instance is somewhat less.

Other adaptations of the spacer technique described here are noted.

### **Multiple-Space Space Maintainers**

Often parents ask if the fixed space maintainer may be used with equal effect in fulfilling a space for two adjacent missing teeth. The answer is contained in simple mechanics: The spacer bar extends mesially or distally from the abutment tooth. Sometimes the most distant portion of the bar intrudes into the gingival tissues. In this

case the optical pliers may be used to re-establish the proper curve to the spacer bar.

*Possibility of Intrusion Increased—* If the length of the spacer bar were doubled it is apparent that the forces which caused intrusion of a single-spaced bar would also be doubled. The force would be increased even more than double since the added length would increase the leverage. Thus the chance of intrusion for a longer spacer

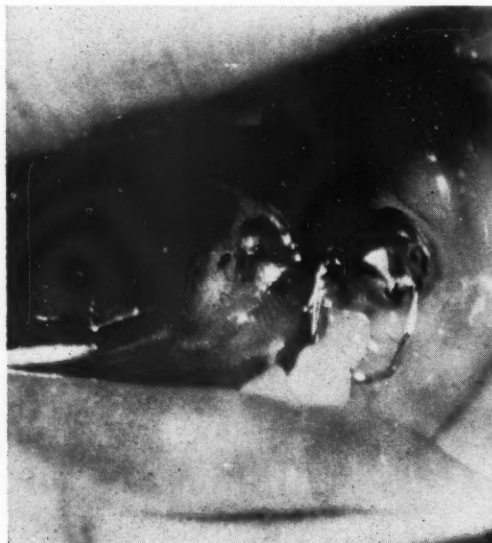


Fig. 9—Space-maintaining appliance cemented in place.



Fig. 10—Space created by extraction of first and second deciduous mandibular molars.



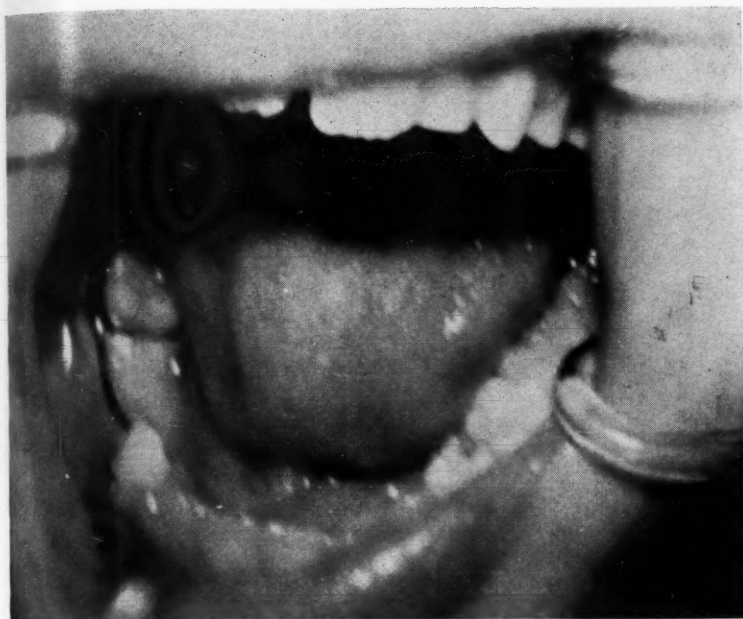


Fig. 11—Banded first permanent molar with single bar space maintainer preserving space for first and second permanent bicuspsids.

bar would be greatly enhanced.

**Substitute for Acrylic Partial Space Maintainer**—Sometimes, for economic reasons, it is impossible to use the acrylic partial space maintainer in these patients. If the long wire spacer is required the tooth against which it rests should have a crown or band placed on it and a bar rest should be constructed of .032 wire, spot welded and soldered to the crown or band. With this rest in place and the spacer bar fitted snugly to it there will be less opportunity for intrusion.

**Method to Secure Multiple Space**—A multiple space may also be secured by banding or crowning the two abutment teeth and soldering the spacer bar to both, either on both the buccal and the lingual or by means of a buccal or lingual wire alone.

### Procedure in Hospital

It is usually impossible to complete space maintainers in the hospital. The spark and hot carbon point of the spot-welder are incompatible to the presence of explosive anesthetic gases in the operating rooms.

Recalcitrant children who should be treated in the hospital usually are sufficiently cooperative to have the crown

fitted in the office and the space measured with the spacer bar in place in the mouth. When this step is completed the dentist may spot weld, solder, and polish the space maintainer after the patient leaves the office. The completed spacer may be taken to the hospital and inserted under hospital conditions as an ordinary steel crown would be placed. If an extraction is indicated before placing the fixed space maintainer it may be done during the hospital procedure.

### Multiple Space Maintainers

A method of treating a multiple space with the use of the acrylic par-

tial denture has been indicated. The advantages of this appliance in restoring the chewing mechanism as well as maintaining the space are notable. Situations may develop, however, which require a choice: (1) acrylic partials for bilateral space loss, or (2) fixed space maintainers.

**Removable Appliance**—If there is question concerning the prognosis of the abutment teeth it probably would be advisable to employ the acrylic partial denture. In this case, if another tooth is lost later, it can be added to the partial. If fixed spacers had been used the loss of an abutment tooth would nullify the space-saving element in the quadrant. The dentist is confronted with a double space to preserve although the fixed space maintainer on the opposite side contraindicates an acrylic partial. The problem is avoided by immediate use of the removable appliance.

**The Fixed Maintainer May be Chosen**—If the abutment teeth are sound and there are single spaces throughout the arches, the fixed space maintainer will be the method of choice. In this method the disadvantages of breaking or losing the partial denture rather than wearing it, and frequent appointments for adjustments, will be avoided.

### Summary

One of the most important functions of the primary tooth is that of maintaining arch space. When these teeth have been lost through caries or trauma it is the dentist's responsibility to inform the parent of the potential for malformed dental arches as a result of space loss. A stainless steel crown (or

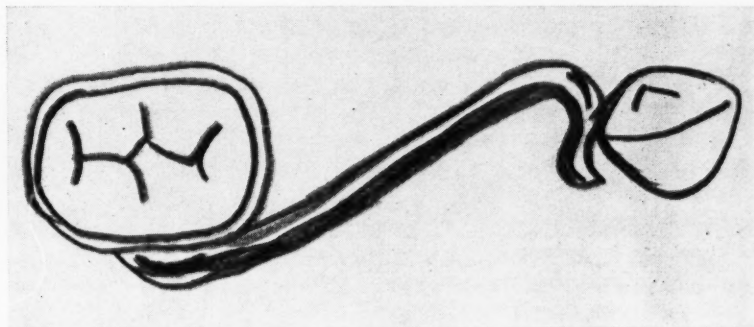
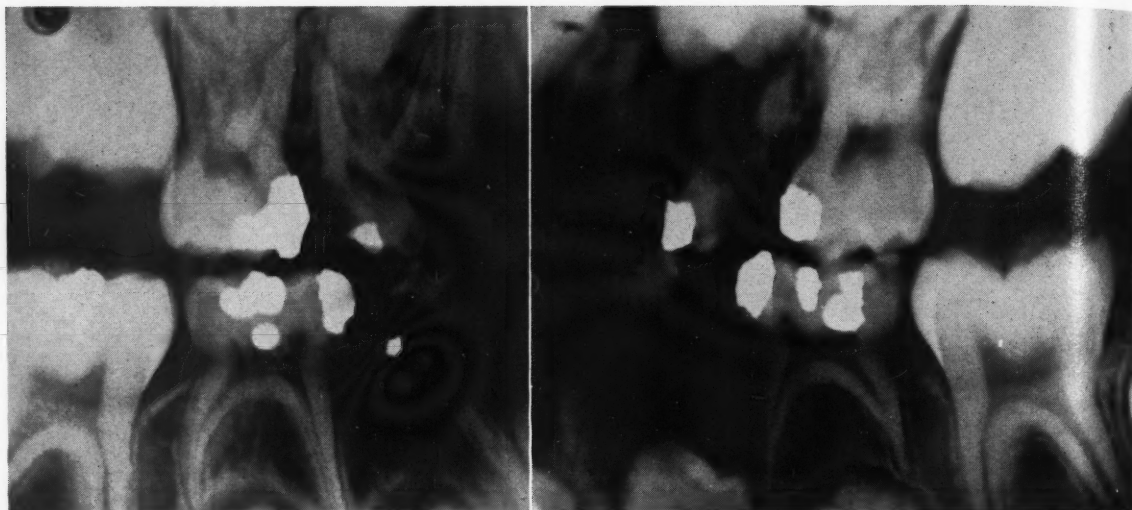


Fig. 12—Curvature is shown of a single bar space maintainer for multiple spaces (.032 round wire).



**Figs. 13 and 14**—Right and left bitewing radiographs showing evidence of periapical infection on the four first deciduous molars.

band) fixed space maintainer is highly recommended for saving this space and preventing a future problem. A method is shown for performing this operation with efficiency and effective-

ness in minimal time. Other adaptations of stainless steel space maintainers for multiple spaces, double spaces, and hospital space-maintaining procedures are described. The stainless steel

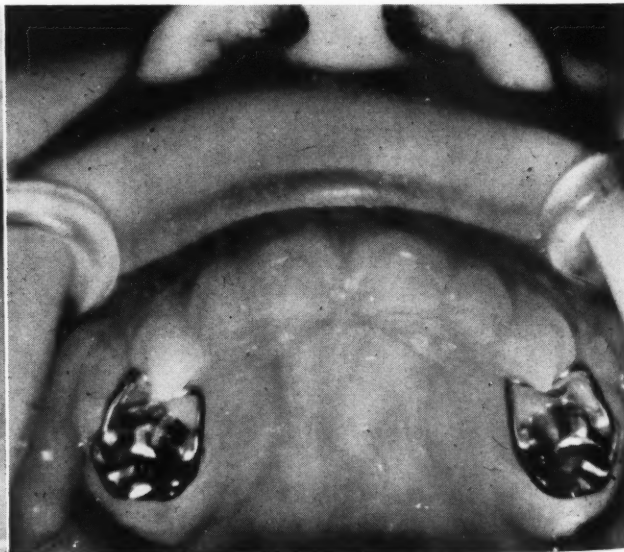
space maintainer is the most effective preventive instrument available to the orthodontist.

(End of Part Two)

504 Carver Building



**Fig. 15**—Two mandibular space maintainers in place replacing lower first primary molars.



**Fig. 16**—Two space maintainers in place replacing extracted upper first primary molars.

## The Physical Aspects

### OF THE MENISCUS

LEONARD FRANK, San Francisco

#### DIGEST

It is generally believed that the meniscus is the "movable socket" that carries the condyle into all of its eccentric positions. This concept is questioned by the author and at least one other investigator.

As no investigator has actually visualized condylar movement in the living human organism activated by living muscles and living nerves and has not seen a sufficient number on which to base an opinion the ideas in this article are necessarily purely conjectural. These present concepts are based on information provided by x-rays both still and moving, fluoroscopic examinations, and other graphologic means including studies of the dry skull, and cadavers.

#### Possible Positions and Function of the Meniscus

In the normal movement of the condyle from closed to open position there is little or no need for the meniscus to change positions. The following questions present:

1. As the condyle moves down and forward to open position, to the articular tubercle, could it be that the meniscus, instead of moving as a "movable socket" merely changes shape? That is, as the condyle moves down and forward, does the meniscus thicken posteriorly and thin anteriorly, and is the converse true as the condyle returns to the depth of the fossa?

2. When the meniscus changes shape as the condyle moves back and forth from the depth of the fossa to the tubercle, is the meniscus really acting as

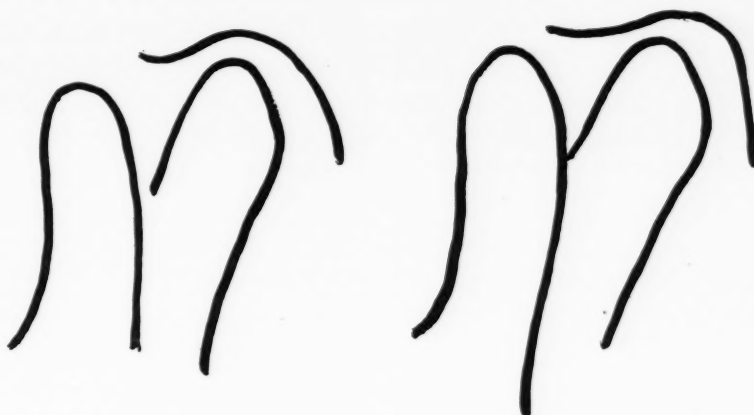


Fig. 1—Examples of hypermobile condyles in front of and below the articular tubercle traced from the original x-rays.

an articular surface, not only in the rotational movement but also in the translational movement?

3. Does the meniscus act as a shock absorber protecting the skull?

4. These possibilities do not seem extraordinary when the condyle remains within the fossa, moving from

the depth of the fossa to the articular tubercle. But what happens to the meniscus when a hypermobile condyle moves beyond the articular tubercle into the infratemporal fossa?

#### Movements of the Condyle

It is not unusual in condylar studies

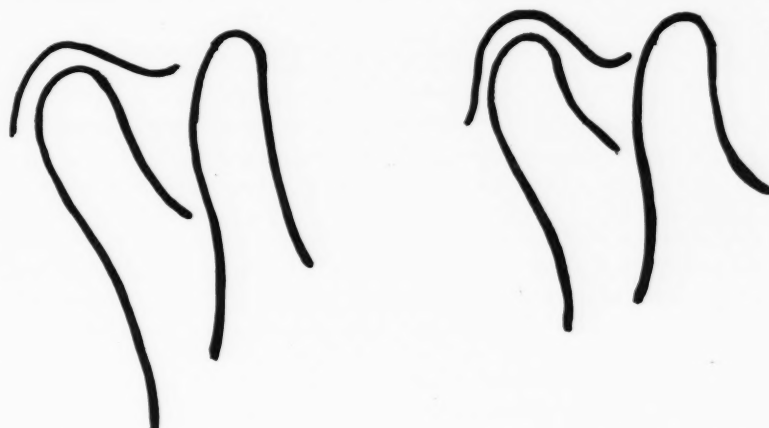


Fig. 2—Examples of hypermobile condyles in front of and above the articular tubercle traced from the original x-rays. The position of these hypermobile condyles is identical with the classic position of a dislocated condyle.



to see the condyle in front of and below the tubercle (Fig. 1), in front of and above the tubercle (Fig. 2) and, in at least three cases, the condyle has traveled forward midway into the infratemporal fossa (Fig. 3). Surely, in these instances the meniscus could no longer act as a "movable socket" inasmuch as the meniscus has no longer a surface to articulate with and the condyle is now moving in space. It should be noted that when the condyle moves into the three positions described, (1) in front of and below the articular tubercle (Fig. 4), (2) in front of and above the articular tubercle, and (3) midway into the infratemporal fossa, the condyle has no difficulty whatsoever in making the return movements into the fossa. How is this possible?

**Further Movement Muscular**—Apparently, the moment the condyle passes the articular tubercle into space and the meniscus loses contact with the articular surface of the glenoid fossa, any further movement is entirely muscular without benefit of an articular surface. Some thought, however, must be given the capsule and its attachment to the condyle. The capsule is quite elastic and allows the condyle great freedom of movement and may play a part in the return of the condyle to the glenoid fossa.

**Condyles Part of Mandible**—It must be recognized that the condyles are a part of the mandible and as the mandible moves the condyles also move. Any movement of the condyles is merely a reflection of the movement of the mandible.

**Free Moving Joint**—The condyles are the only bilateral joints in the skeleton. They are the only free moving joints. All other joints move within their sockets and any deviation from this movement in their socket causes a dislocation. The condyle is not confined to the glenoid fossa. It can move up and down (opening movement), side to side (balance and working position), front and back (retrusive and protrusive position) freely, and even beyond the articular tubercle.

**Condyles Have No Independence of Movement**—The mandible hangs in a muscular sling composed of the masseter and internal pterygoid muscles and

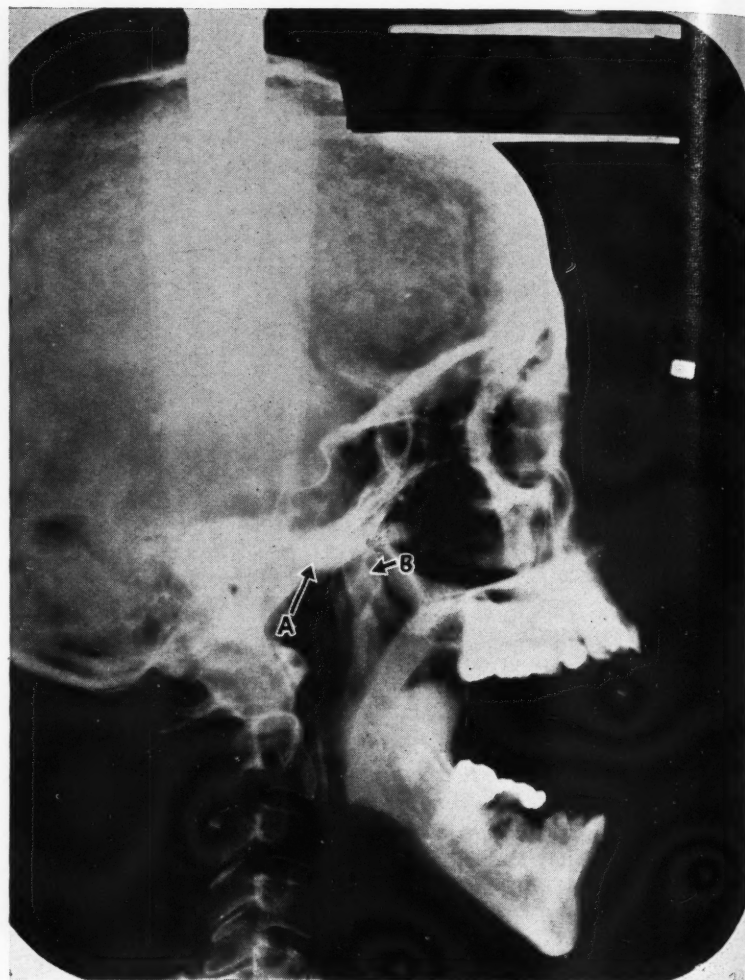


Fig. 3—Cephalometric view of the head. (A) Articular tubercle. (B) Condyle in open position, in the infratemporal fossa.

stabilized by the external pterygoid muscle. The condyles have no independence of movement. As the condyle moves out into space, without benefit of an articular surface, the integrity of the mandible is protected by its muscular sling and stabilizing muscles and its forward movement is supposedly limited by the ligaments.

**Return from Position of Dislocation**—The classic position of a dislocated condyle is in front of and above the articular tubercle and yet it is not unusual to see a condyle in the classic position of dislocation, with no effort, move evenly and smoothly back into the glenoid fossa. Conversely, in those persons who suffer dislocations the condyle is in the position just described.

**Possible Cause Examined**—Is the

cause taut or short ligaments so that when the mandibular opening is over-extended the cant of the condyle is such that it causes the condyle to slip over the articular tubercle? Do the muscles then pull it upward causing a dislocation? It is curious that observing two condyles, both in the classic position of dislocation, one will move smoothly and evenly back into the fossa while the other will remain dislocated. Is this a case of long or short ligaments? As a further observation, both condyles have traveled into space without benefit of their menisci.

**Question of Hypermobile Movement**—Referring to the hypermobile movement discussed, Campbell<sup>1</sup> states, "It is

<sup>1</sup>Campbell, John: Silencing the Temporomandibular Click: A Method of Determining the Vertical Dimension, DENTAL DIGEST 64:62-65 (Feb.) 1958.  
<sup>2</sup>Ibid.



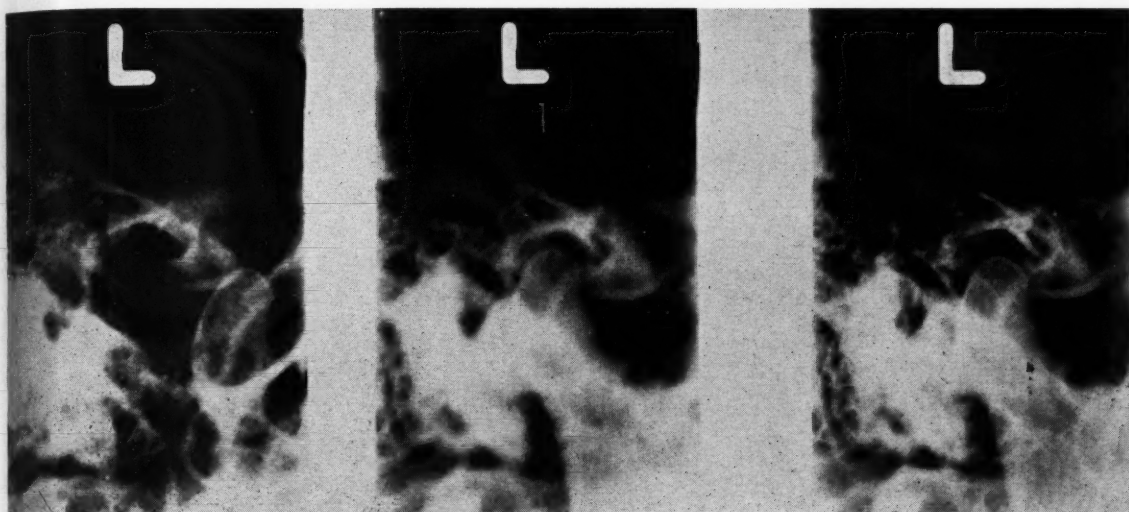


Fig. 4—X-ray of a condyle in rest, closed, and open position. In the translation to open position the condyle is in front of and below the articular tubercle.

inconceivable that the condyle should drift away from the eminentia during its passage. If the joint space alters its proportions when translating, then there must be a looseness in the joint ligaments and this is incongruous with the unstretchable nature of the ligamentous tissue. This opens a new line of thought; how can the condyle translate so smoothly if the ligaments are unyielding."

**Structural Differences**—Is it possible that the ligaments in certain subjects are longer or shorter than in others? There is no reason why this may not be true. People do differ and it follows that the structure of their bodies differ. If this concept is accepted it could be the answer as to why the condyles of some persons will travel into space and return into the fossa and others will not.

### **Return of Condyle into the Fossa**

The forward movements of the condyle have been discussed. However, the condyle not only moves forward but returns into its fossa and back to its articulating surface. There is no retractor muscle attached to the condyle or the meniscus.

**Muscle Retraction of Mandible**—While it is true that there is no muscle attached to the condyle or the meniscus actively engaged entirely in retraction there is a muscle that can exert

some retraction on the mandible. A portion of the temporal muscle is retractive.

**Function of Temporal Muscle**—The temporal muscle is unique in that it has the ability to help retract, raise, or protrude the mandible. The temporal muscle is attached to the coronoid process. The retractive portion of the temporal muscle, exerting retractive pressure to the coronoid process can to some extent draw the mandible posteriorly.

**Condyles Reflect Movements of Mandible**—Keep in mind that the condyles, being part of the mandible, move with the mandible posteriorly toward the fossa. Again, the movements of the condyles are merely a reflection of the movements of the mandible.

**Lifting Movement of Muscles**—As the temporal muscle draws the mandible posteriorly the masseter and the internal pterygoid muscles, with some help from the temporal muscle, start lifting the mandible so that the condyle may return to its normal position in the fossa. As the lifting movement of the masseter, internal pterygoid, and temporal muscles, with the external pterygoid muscle acting as a stabilizer continues, the condyle again enters the fossa.

**Condyle Again in Normal Position**—Again contacting the articular surface of the fossa, the condyle moves back and upward until the teeth oc-

clude thus arresting further upward movement. The condyle has now returned to its normal position in the fossa.

**Function Accomplished Without Effort**—The movement of the condyle, down and forward, losing contact with the articular surface of the fossa, moving outward, past the articular tubercle, on into space, and again moving back and upward to the normal position in the fossa is accomplished smoothly with apparently no effort, and apparently no strain. Again, according to Campbell,<sup>2</sup> "The condyle may be recognized well in front of the eminentia; further muscle retraction has lifted it to a higher level. This state of affairs is common, yet the patient is unaware of the bizarre mandibular action."

### **Summary**

The meniscus has been discussed. The concept that the meniscus is the "movable socket" carrying the condyle into its eccentric positions is questioned. The movement of the condyle from closed to open position is examined in relation to hypermobility when the condyle appears to travel into space and the meniscus apparently loses contact with the articular surface of the glenoid fossa. Some theories are advanced which may explain this series of movements.

450 Sutter Street

# A Technique for REINFORCING AMALGAM RESTORATIONS

RICHARD S. YOUNGS, D.D.S., Adrian, Michigan, and  
FRANCIS M. SCHMITT, D.D.S., Garden City, Michigan

## DIGEST

The technique illustrated in this article is one developed by Miles R. Markley.<sup>1</sup> It allows the dentist to make an inexpensive amalgam crown and also offers the oppor-

tunity to place amalgam with suitable retention in badly broken-down teeth. A tooth that is rebuilt in this fashion may be used for a crown preparation or for a bridge abutment.

## Special Mix Used

According to Doctor Markley who originated the technique described here, silver amalgam reinforced with threaded stainless steel posts is as different from ordinary amalgam as the

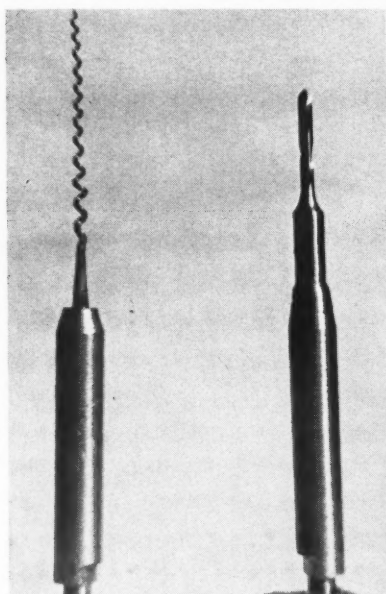


Fig. 1—*a*: Lentulo spiral to spin cement into pin holes.  
*b*: .027 Spence Baker bur. For making pin retention holes.



Fig. 2—.025 Stainless steel threaded wire for retention posts.

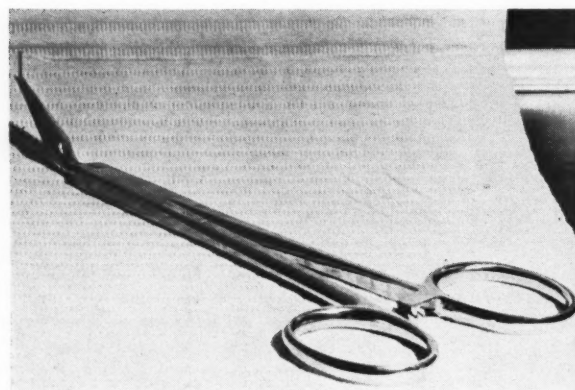


Fig. 3—Stiltz forceps for placing Markley posts into retention holes.

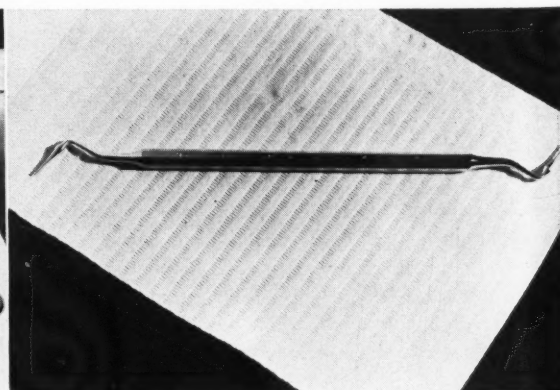
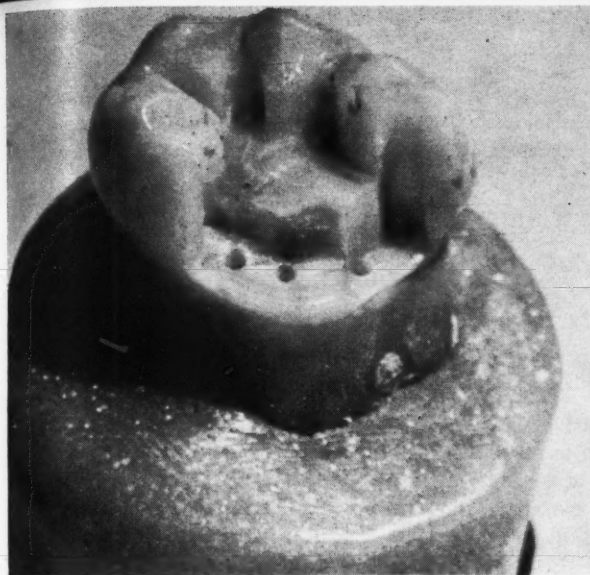
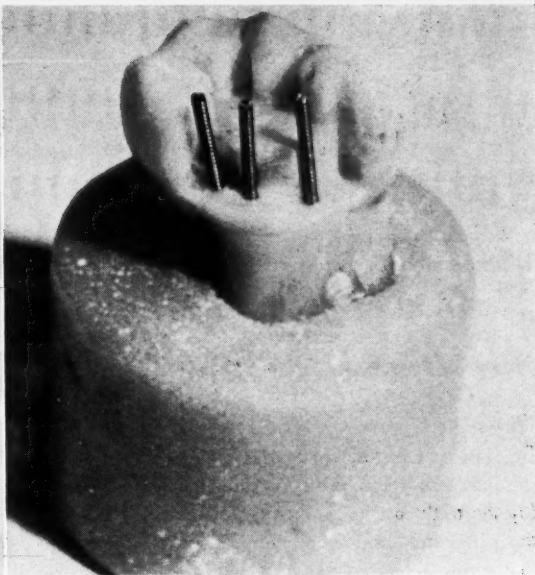


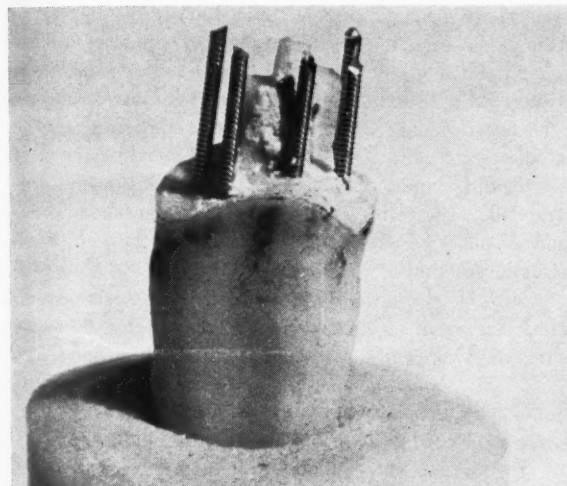
Fig. 4—Pin waxer for use in packing amalgam between and around posts and matrix.



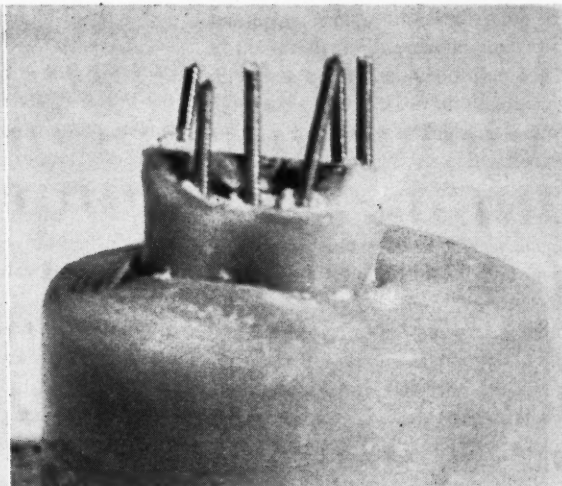
**Fig. 5—Lower first molar with retention holes placed for three threaded posts.**



**Fig. 6—The same lower molar with the three stainless posts in place. Notice, these posts are not parallel. This is an advantage for retention of the amalgam.**

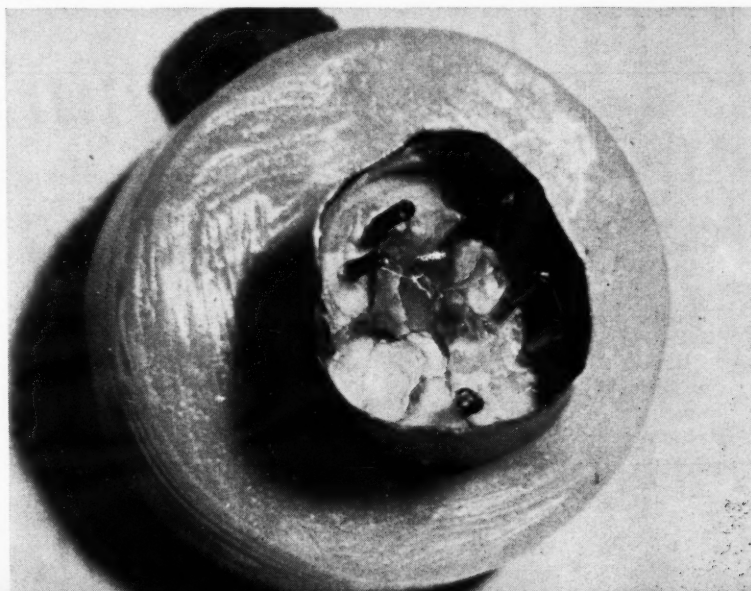


**Fig. 7—A badly broken-down cuspid that has five retentive posts. After rebuilding with amalgam a 700 or 701 tapering fissure bar can be run slowly inside the matrix band to form a shoulder. This makes a suitable crown preparation.**



**Fig. 8—A badly broken-down molar with six retentive posts, not parallel.**

**Fig. 9—The same molar with a copper band placed.**



concrete in a sidewalk is different from the reinforced columns of a modern skyscraper. A retarded mix of crown and bridge cement is used to cement the pins in place.

### **Materials Needed**

To complete the technique the fol-

<sup>1</sup>Markley, Miles R.: Pin Reinforcement and Retention of Amalgam Foundation and Restoration, JADA 56:675-679 (May) 1958.



lowing materials will be required:  
0.27 Spence Baker bur  
.025 Stainless steel threaded wire  
Lentulo spiral to spin cement into  
pin holes

Wire cutting clippers

Disc or stone to remove rough edges  
from wire

Grooved cotton pliers  
Cementing material  
1/2 Round carbide bur

### Comment

The authors have used the tech-

nique described for several years with gratifying results. Many otherwise un-restorable teeth have been saved both for individual restorations and for use as bridge abutments.

133 East Maple Avenue (R.S.Y.)  
29627 Ford Road (F.M.S.)

## Swelling of Tongue

### Problem

On four or five different occasions in the past two years, either on retiring for the night or on awakening in the morning, and, on one occasion during the night, a patient's tongue became swollen. Twice the patient was helped by subcutaneous administration of diphenhydramine hydrochloride. On the other occasions, chlorpheniramine tripelemnamine reduced the swelling. The condition appears to be an allergic reaction, but a definite cause cannot be found. On the first occasion the patient awoke with a swollen tongue while in a hospital, receiving continuous sacral tetracaine anesthesia for an acute arterial occlusion. After the administration of diphenhydramine relief was obtained within a few minutes. On the other occasions he was at home and not taking any drugs. No other allergic manifestation has been observed. What is the cause and treatment of this condition?

### Discussion

The prompt administration of antihistaminic drugs has without exception brought relief from the swelling

described. Although the tongue has been swollen no mention is made of the occurrence of an associated respiratory embarrassment.

**Possible Causative Factors** — The description given would suggest the onset of angioneurotic edema of the tongue. The first episode would suggest that the anesthetic agent then being administered may have been a causative factor. Although allergy to drugs may have been responsible for the initial episode, other factors such as fatigue, tension, bacterial or parasitic infection, or an allergic response to other allergens, particularly ingests, may have contributed. A study of allergic factors would probably be of limited, if any value in the solution of this problem.

**Treatment Measures Suggested** — The following measures would appear indicated:

1. The patient should avoid the use of a paraaminobenzoic acid type of local anesthesia of the tetracaine group if dental or other indications for local anesthesia should arise. Local anesthetic agents with a significantly different structure, such as lidocaine hydrochloride, usually are well toler-

ated by persons who are sensitive to the paraaminobenzoic acid category of local anesthetic agent.

2. The patient should carry on his person epinephrine hydrochloride for subcutaneous administration should additional reactions occur. Small amounts of this agent probably should be used against attacks of swelling, despite the history of the vascular disease mentioned. There is a reasonable chance that the swelling in the tongue may extend into the throat and produce respiratory embarrassment.

3. The patient should carry on his person one of the antihistaminic drugs mentioned. This agent should be ingested promptly at the earliest evidence of swelling.

4. It should be ascertained that other medications, such as aspirin or penicillin, have not been used, since allergy to other drugs might contribute to the problem described.

5. The patient should avoid fatigue and take adequate treatment for any infection.

Adapted from Questions and Answers, *Journal of the American Medical Association* 173:972-973 (June 25) 1960.

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# Estrogenic Control and Prevention of Bleeding AFTER DENTAL EXTRACTION DURING LONG-TERM ANTICOAGULANT THERAPY\*

H. J. ROBERTS, M.D., West Palm Beach, Florida

## DIGEST

*In patients maintained on long-term anticoagulant therapy the prevention and management of bleeding after dental surgery frequently poses a problem. Results of experience with the intravenous and oral administration of estrogens in nine cases of dental bleeding are described in this article and two case histories are presented. In most cases the preparation for dental surgery included stopping the oral administration of the anticoagulant for several days and increasing the dose of orally administered estrogen, if the patient had been taking it. Conjugated equine estrogens were administered one half hour before the extraction. Hospitalized patients having extensive extractions were given the estrogen again several hours later.*

## Problem of Postextraction Hemorrhage

The prevention and management of bleeding following dental surgery in patients with myocardial infarction, strokes, and other vascular disorders who are being maintained on long-term anticoagulant therapy still leaves much to be desired. This problem confronts every physician and dentist who cares for the increasing number of patients receiving such therapy.

**Small Dose of Vitamin K Ineffective**—Temporary cessation of the anticoagulant and the administration of a small dose of some vitamin K preparation, either orally or parenterally, might not be adequate to prevent or control the bleeding.

**Hazards Involved in Large Dose of Vitamin K**—The administration of vitamin K in large doses may abolish the proved prophylactic value of antico-

agulants or render subsequent regulation of anticoagulant therapy difficult. Re-inducing a therapeutic lowering of the prothrombin level after a vitamin K preparation has been given is more apt to be a problem with prothrombin-depressant drugs characterized by a slow induction and a slow recovery (for example, bishydroxycoumarin) than with those having a short induction and a short recovery time (for example, certain of the indandione agents).

**Risk of Rebound Thrombo-Embolicism**—Sudden discontinuation of drugs of the coumarin series is hazardous in light of the restoration of the original risk of thrombosis and the high incidence of "rebound" thrombo-embolicism that occurs in the second to sixth week after the original episode.

## Methods and Results

The author has employed with notable success intravenous estrogens for the prevention or management of bleeding associated with dental surgery in nine private patients observed over a three-year period.<sup>1</sup> In most of the cases, no vitamin K preparation was given. The only pertinent comparable report is that of an elderly hemophiliac whose massive hemorrhage after dental extraction was uncontrollable until the administration of Premarin Intravenous.<sup>2</sup>

**Preparation Used**—The intravenous preparation employed was Premarin Intravenous.<sup>\*\*</sup> This drug comes in the form of individual "Secules" each containing 20 milligrams of estrogens in a naturally occurring, water-soluble conjugated form (expressed as sodium estrone sulfate). Immediately before

infusion, the solution was slowly reconstituted by means of sterile diluent containing 0.5 per cent phenol, U.S.P., in the accompanying 5-millimeter vial.

**Drug Given Slowly**—The solution was slowly administered intravenously in order to obviate both the occurrence of flushes and unforeseen complications that might develop whenever pharmacologically-active medication is injected intravenously into patients who have cardiovascular disease.

**Procedure**—The measures generally observed were the following:

1. The anticoagulant (Dicumarol®, Liquamar®, Coumadin®) was omitted for approximately 3 days preceding surgery. Premarin Intravenous was injected one-half hour before extraction. No vitamin K preparation was employed prophylactically.

2. The extractions were performed by several oral surgeons using standard techniques, due attention being directed to hemostasis.

3. In every patient, the immediate postoperative bleeding was minimal, even in the presence of a significant residual hypoprothrombinemia (that is, a prothrombin time longer than 20 seconds, with controls averaging 15 seconds).

4. An additional dose of Premarin Intravenous was given from 4 to 8 hours afterward in those patients who had been hospitalized for extensive extractions or who subsequently experienced any degree of persistent local oozing. The oral anticoagulant was resumed the day after dental surgery.

**No Significant Changes in the Clotting Mechanism**—Even though a salutary effect had been produced, repeat prothrombin times taken at varying intervals after injection of estrogens in hypoprothrombinemic patients with both postextraction and spontaneous bleeding usually failed to demonstrate any significant changes. (This has

<sup>\*\*</sup>Supplied by Ayerst Laboratories, New York.

<sup>1</sup>Roberts, H. J.: Control of Bleeding After Dental Extraction During Anticoagulant Therapy: With Particular Reference to Estrogenic Prophylaxis, *JAMA* 175:662 (March 18) 1961.

<sup>2</sup>Whittington, P. B., Jr.: Control of Bleeding with Intravenous Estrogens, *JADA* 53:595 (Nov.) 1956.

\*Adapted from *Journal of the American Medical Association*.

been the experience of most other investigators in this field.) There have been occasional exceptions.

### **Broad Applications**

In an experience involving the administration of several hundred such infusions in the management of other disorders the author has observed no significant systemic, allergic, or local inflammatory reactions to Premarin Intravenous.

**Other Indications**—These have included (1) the management of severe prostatism and urinary stress incontinence in the presence of serious congestive heart failure, myocardial infarction, and strokes, (2) the management of severe gastrointestinal hemorrhage with or without associated portal hypertension; (3) the prevention and management of spontaneous bleeding in other patients receiving long-term anticoagulant therapy; and (4) the prevention and management of intraocular hemorrhage in patients having diabetic retinopathy.<sup>3,4</sup> Doses as high as 500 milligrams of Premarin Intravenous have been injected by others within a twenty-four hour period without demonstrable deleterious effects. A 21-year old male patient with generalized bleeding due to aplasia of the marrow was given more than 3000 milligrams of Premarin over a four-month period for the control of widespread bleeding without complications attributable to this intravenous medication.

**Water Retention Not Encouraged**—Neither hyperestrogenic effects nor significant retention of sodium chloride and water are encountered, especially when only short-term intravenous therapy is employed. Their absence can be best explained by the following: (1) the rapid excretion of the hormone from the body, affording it little opportunity to exert an appreciable action on either the target organs or the kidneys; and (2) the rapid metabolizing of the intravenously administered estrogen and its conversion into non-active metabolites.

**Oral Treatment**—In a few patients

who previously had been receiving oral estrogen therapy, the drug was continued or increased for varying periods of time preceding and following extraction. In other types of minor bleeding, such as epistaxis and purpura, treatment has been limited to the oral route with success, often merely by increasing the maintenance dose of the estrogen.

**Protective Action Inferred**—Defense afforded by oral estrogens against bleeding in patients receiving long-term anticoagulation therapy for underlying coronary heart disease (aside from those undergoing dental extractions) has been inferred in retrospect on a number of occasions.<sup>3</sup> For example, the recurrence of skin bleeding or of brisk rectal bleeding in several patients after a placebo of similar appearance had been substituted and the prompt control of such bleeding upon resumption of the active estrogen appeared to merit such a conclusion.

### **Representative Case Reports**

**Case One**—A 38-year-old carpenter had experienced three episodes of severe pulmonary embolism and infarction following a traumatic thrombophlebitis of the right leg. The second and third attacks occurred within four weeks of discontinuing oral anticoagulation. He also developed angina pectoris. On a resumed program of long-term anticoagulation, there were no further episodes of pulmonary embolism for 16 months. Prothrombin times generally ranged between 25 and 33 seconds.

**Teeth Extracted**: The patient's upper teeth were carious; extraction was recommended. After discontinuing Liquamar® for four days, he entered the hospital. The prothrombin time was found to be 21.0 seconds several hours before surgery. He received 20 milligrams of Premarin Intravenous one-half hour prior to the extraction of eleven upper teeth and again three hours later. No vitamin K was administered.

**Minimal Postoperative Bleeding**: The oral surgeon commented upon the minimal operative and postoperative

bleeding. The anticoagulant was resumed the day after surgery. Three days later, the patient's prothrombin time was 23.6 seconds.

**Case Two**—In a 49-year-old engineer persistent angina pectoris was present as well as a functional gastrointestinal syndrome. The patient subsequently had two frank myocardial infarctions necessitating hospitalization. Because of protracted severe chest pain, despite long-term anticoagulant therapy, he was subjected to pericardial poudrage with concomitant ligation of the internal mammary artery. Following his second myocardial infarction (which occurred after the pericardial surgery), long-term anticoagulant therapy was resumed. The patient ultimately was able to return to his work as an industrial engineer.

**Postoperative Progress**: The patient fared well on the anticoagulant program with no bleeding episodes until one tooth required extraction. Despite withholding the anticoagulant (Liquamar®) for several days, good dental technique, local packing, and the subsequent ingestion of four Mephyton® tablets (20 milligrams), the operative site continued to bleed profusely for two days. (Routine prophylactic intravenous estrogen therapy was not being utilized at that time.) The prothrombin time was still elevated (namely, 24 seconds).

**Bleeding Arrested**: The author was called to see the patient the following night because of actual hemorrhage from the operative site. He was given 20 milligrams of Premarin Intravenous. A pack containing a small amount of epinephrine also was applied. Within several hours, the bleeding had ceased completely. The patient's maintenance anticoagulant dose subsequently was resumed without incident.

### **Discussion**

The inherent risk of bleeding following trauma or surgery in patients being maintained on long-term anticoagulant therapy cannot be denied. Nevertheless, there probably exists an unwarranted fear of operative and postoperative bleeding in patients un-

<sup>3</sup>Roberts, H. J.: Estrogens in the Treatment and Prevention of Bleeding Associated with Long-term Anticoagulant Therapy, *J. Am. Geriatrics Soc.* 9:184 (March) 1961.

<sup>4</sup>Roberts, H. J.: Diabetic Retinopathy, *JAMA* 175:161 (Jan. 14) 1961.

dergoing uncomplicated surgical procedures (that is, femoral vein ligations, amputations, and even appendectomy)—provided that careful attention is directed to surgical hemostasis.

**Problem of Differentiation**—Unfortunately, the laboratory techniques currently available to most clinicians are totally inadequate to establish differentiation between potential bleeders and nonbleeders. For example, the unreliability and potential harm resulting from dependence upon routine bleeding and clotting times in children being subjected to tonsillectomy and adenoidectomy has led to their de-emphasis and actual discard in several centers.<sup>5</sup>

**Hemorrhage During Controlled Anticoagulant Therapy**—In discussing the problem of anticoagulant-induced hemorrhage, Brinkhous<sup>6</sup> recently has summarized some of the current concepts: "It appears that nature has provided man with a hemostatic mechanism in which there is a wide margin of safety. Three major components of this system have been emphasized: fibrin coagulation, platelets, (both quantitative and qualitative aspects), and integrity of the smaller vessels, particularly in the microcirculatory system. It appears from both experimental and clinical experience that at least two of the three factors must be altered before significant hemorrhage occurs (Jacques). Since Dicumarol type therapy affects predominantly the fibrin coagulation mechanism, it may be that transient changes in the other two systems, possibly unrelated to the therapy itself, become the determining factor as to whether or not hemorrhage occurs in patients during controlled anticoagulant therapy."

### **The Pharmacologic Basis of Estrogenic Hemostasis**

The probability of there being sev-

eral potential mechanisms for estrogenic hemostasis is suggested by the reported value of intravenous and oral estrogens in the control of the following conditions:

1. Traumatic hyphema
2. Massive subconjunctival hemorrhage
3. Massive gastrointestinal hemorrhage associated with portal hypertension or with peptic ulcer, salicylate-induced hemorrhagic gastritis, anticoagulant therapy, and diverticulitis.
4. The management of recurrent intraocular hemorrhage associated with diabetic retinopathy
5. The management of epistaxis associated with hemorrhagic telangiectasia
6. The control of delayed post-traumatic hemorrhage
7. Functional uterine bleeding
8. Bleeding after tonsillectomy, prostatectomy, and ophthalmic surgery

It appears that conjugated estrogens exert a minor influence on the blood clotting mechanism, but more significantly on the capillary bed.

**Coagulation Factors**—The rapid increase in concentration of estrogens as a result of intravenous injection is probably an important factor in promoting coagulation of the blood. Intravenous conjugated equine estrogens produce little or no change in thrombocyte counts of the peripheral blood either in patients having normal platelet counts or those with thrombocytopenia. One mechanism of action proposed to account for estrogen-enhanced coagulation relates to the sharp rise in Factor V (plasma Ac-globulin, proaccelerin, labile factor). This change was noted in dogs within the first 15 minutes after the intravenous infusion of estrogenic steroids, reaching a peak in approximately 90 minutes, and returning to normal concentrations by 4 hours.<sup>7</sup> As noted, the author usually could not detect any measurable alteration in prothrombin concentration with the use of Premarin Intravenous in patients with induced hypoprothrombinemia who had begun to bleed.

**No Significant Changes**—Detailed studies in human beings by Glueck<sup>8</sup>

specifically relating to the effect of Premarin Intravenous on the individual factors involved in the coagulation process revealed an increase in Factor V, but no demonstrable change in the prothrombin time, the prothrombin content, Factor VII, the bleeding time, the clotting time, or the clot retraction. Others have been unable to confirm the increase in Factor V, however.

**Hemostatic Action of Estrogens Studied**—Perhaps the most significant studies explaining the hemostatic action of estrogens are those currently being carried out dealing with their effect on the acid mucopolysaccharides of the ground substance surrounding blood vessels which have an important bearing upon capillary permeability and fragility. By means of colloidal iron and toluidine blue stains, Burn and Schiff<sup>9</sup> repeatedly have demonstrated a progressive change lasting several hours from the sol state to the gel state of the tissue mucopolysaccharides in hamsters, monkeys, and man following the use of Premarin Intravenous. This alteration appears to be due to an increase both in the quantity and polymerization of the mucopolysaccharides in the ground substance about the small vessels and in the arteriole walls, an effect that occurs equally in men and women.

### **Summary**

The prevention and management of bleeding after dental extraction in patients receiving long-term anticoagulant therapy has been facilitated in nine patients by means of intravenous and oral estrogens. After cessation of the oral anticoagulant for several days to achieve partial anticoagulant decontrol, the patient is given conjugated equine estrogens before extraction, which may be repeated after extraction if needed. The importance of careful surgical hemostasis still remains paramount.

The advantages and rationale of this program have been considered, especially in view of the potential difficulties incurred both by vitamin K therapy and prolonged cessation of indicated anticoagulation.

1525 North Flagler Drive

<sup>5</sup>Diamond, L. K., and Porter, F. S.: Inadequacies of Routine Bleeding and Clotting Times, *New England J. M.* 259:1025 (Nov. 20) 1958.

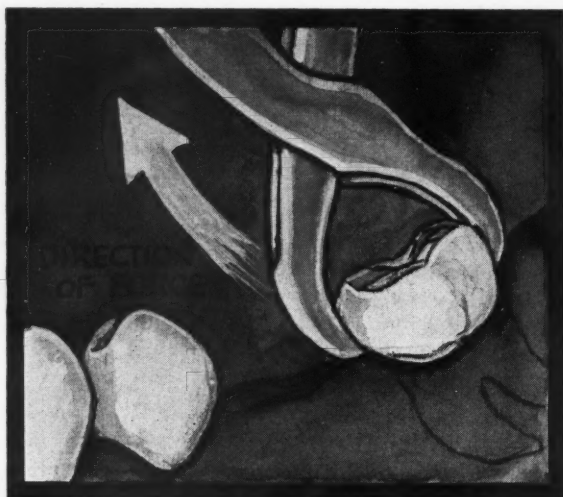
<sup>6</sup>Brinkhous, K. M.: Discussion of Paper by Boyles, P. W.: Hemorrhagic Diathesis Associated with Long-term Anticoagulant Therapy, *Southern. M. J.* 53:441 (April) 1960.

<sup>7</sup>Johnson, J. F.: Changes in Plasma Prothrombin, Ac-globulin, and Anti-thrombin Concentration Following Intravenous Administration of Estrogens, *Proc. Soc. Exper. Biol. & M.* 94:92 (Jan.) 1957.

<sup>8</sup>Glueck, H.: Personal communication.  
<sup>9</sup>Schiff, M., and Burn, H. F.: The Effect of Intravenous Estrogens on Ground Substance, *Arch. Otolaryng.* 73:43 (Jan.) 1961.



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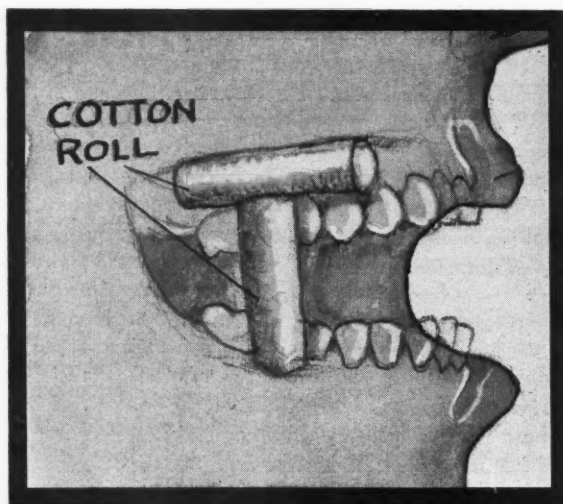
## Clinical and Laboratory

### Extraction of Lower Molars

Morton Malkin, D.D.S., Brooklyn, New York

1. To extract a lower molar that stands alone and has distally curved roots use an upper universal forceps. Place the beaks on the mesial and distal surfaces and apply force in the same arc as that of the curvature of the roots.

2



### Placement of Cotton Rolls

B. S. Morrow, D.D.S., La Mirada, California

2. In placing restorations in the posterior maxillary teeth use two cotton rolls at right angles to each other.

3



### Applying a Separating Medium

Harry M. Smullen, D.D.S., Brooklyn, New York

3. Spraying varnish on a plaster impression assures a more even coating than application by a brush.

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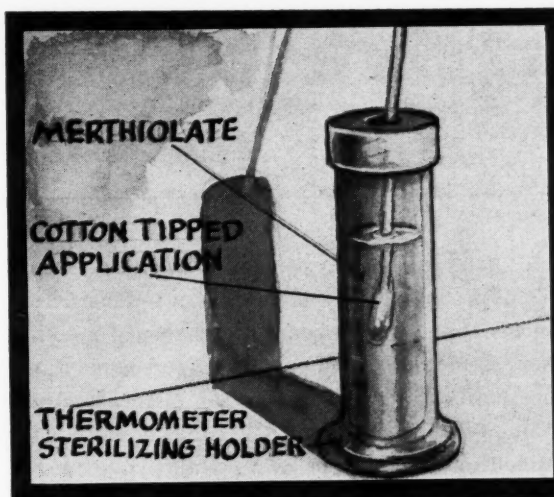
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## SUGGESTIONS . . .

### Easy Access Medicament Bottle

James R. Rusterholz, D.M.D., Brookville, Indiana

4. A clinical thermometer sterilizing holder when used for dental medicaments has these advantages: more hygienic; decreased danger of spilling medication; no bottle cap necessary; less evaporation.

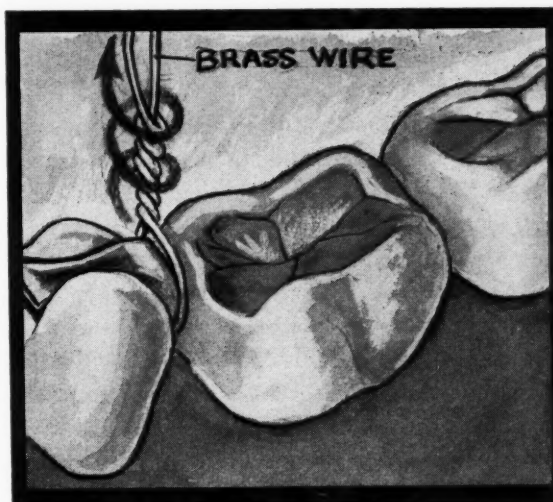


4

### Removal of Gold Inlays

Robert W. Dages, D.D.S., Upper Darby, Pennsylvania

5. To remove a tight fitting inlay after try-in and before cementation pass a brass separating wire through the embrasure. Twist the ends of the wire until the inlay is raised from the cavity preparation.

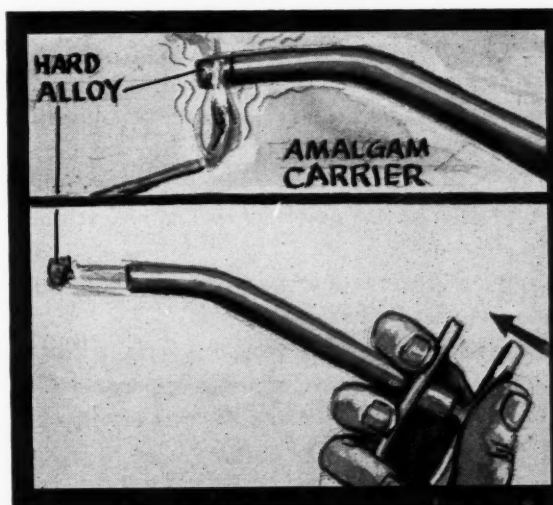


5

### Removal of Hardened Amalgam from Carrier

James D. Ashman, D.D.S., Seattle, Washington

6. When the carrier is plugged with hardened amalgam apply a lighted match to the end of the instrument. After a few seconds push the plunger and the hardened amalgam will be ejected.



6

involved; and jot down the advantages of the technique. This shouldn't take ten minutes of your time. Turn to page 302 for a convenient form to use.

Send your ideas to Clinical and Laboratory Suggestions Editor, DENTAL DIGEST, 708 Church Street, Evanston, Illinois.

## **The EDITOR'S Page**

FOR YEARS it has been believed that man is incapable of producing antibodies to his own tissues. This concept is now questioned in the theory of auto-immunity wherein it is thought that a person may produce antibodies to his own tissue elements. Auto-immunity is the process by which the body produces antibodies to combat its own cellular constituents. For example, a person may develop an infection of some type, body cells are altered, these altered cells act as antigens to produce antibodies, the response to these antibodies may result in an extremely severe reaction and a disease more overwhelming than the initial infection.

Charles C. Sprague, M.D. has made an admirable statement of the role of auto-immunity in human disease.<sup>1</sup> Clinicians have traditionally considered that a person's natural defense was, in part, built around the principle that noxious agents (bacteria, viruses, parasites, inorganic vectors) act as antigens to produce antibodies that resist and overwhelm the foreign invaders. It is this concept of immunity that is questioned in the theory of auto-immunity: "Unfortunately we are discovering an increasing number of conditions where the immunologic response seemingly is such that its consequences are harmful and at times fatal . . .

"During the past 15 years we have come to the realization that under certain circumstances antigens present in or on the surface of a person's cells may evoke the production of antibodies (auto-antibodies). These antibodies differ from iso-antibodies in that they are produced in response to stimulation by the person's own tissue. This response, as in the case of allergy, can be of adverse nature, at times extremely so."

Sprague suggests four ways by which auto-antibodies may be produced:

"1. They may be of heterogenetic origin. That is to say, antibodies may be formed in response to some infection where the offending bacteria or virus has

antigens present in human cells. As a result the antibodies produced will have an affinity for the human cells as well as for the microorganisms.

"2. The surface of a cell may be altered by bacteria, viruses, chemicals, drugs, to the extent that the cell is rendered antigenic.

"3. Certain persons have a marked propensity for developing antibodies; it is possible that in such persons normal cellular constituents may serve as antigens.

"4. There may be a derangement of the host tissue responsible for antibody production so that normal cells or constituents are no longer recognized as indigenous and, therefore, evoke antibody response."

Sprague, who takes an exemplary conservative position on the theory of auto-immunity states:

"Even though there are many basic questions that must be answered before we can begin to define the complete role of auto-immunity in human disease, significant achievements have been made. The chances seem very good that additional research in this area will provide knowledge that will assist in a better understanding of the pathogenesis of many obscure medical disorders. Until such time as some of the unanswered problems are resolved, it would be wise to temper our enthusiasm and to critically evaluate the rapidly expanding literature relating to this concept."

That a person may be actually poisoned, made ill, or killed by his own tissues is certainly a startling biologic theory and one that, unfortunately, may have grave consequences. How far the phenomena of the auto-immune response may extend into the entire field of pathology is unknown. It may be part of the explanation for malignant disease and may explain many reactions from viral and bacteric invasion that are not now understood. So far as the dentist is concerned he may find the theory of importance in the evaluation of focal infection. No observations have been made on the possible role of auto-immunity in dental disease. It presents a fascinating subject for research.

<sup>1</sup>Sprague, Charles C.: *The Role of Auto-immunity in Human Disease*, Med. Science 9:233 (February 25) 1961.





## Depression and Suicidal Attempts

Mental depression affects the entire body, and the presenting symptoms are extremely variable. The patient has a change in mental outlook and in body functions. Many of the 16,200 suicides occurring in the United States each year result from failure in the diagnosis or treatment of depressions.

The chief mental symptoms of depression are pessimism, apprehension, and hopelessness. Profound agitation and collapse may ensue, and delusions and self-accusation may lead to attempted suicide.

Not all depressed persons are suicidal risks. Loss of a loved one, a business failure, or alcoholic or emotional excess may precipitate transient depression. Also, depression may occur during the prodromata of a virus infection or with other physical illnesses. Pancreatic carcinoma, chronic pancreatitis, brain tumor, and intoxication with barbiturates, bromides, and Rauwolfia are often accompanied by depression. Usually depression is relieved when the precipitating cause is removed. Persistent symptoms should lead to suspicion of a more serious mental illness.

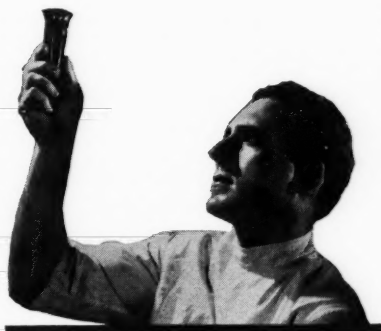
Persons who are chronically depressed, pessimistic, and unhappy rarely attempt suicide. Significant depression commonly represents a striking change for the patient, which may be obvious if the mood of several months before is compared with the present mood.

Among children, depressions and suicidal gestures are infrequent. Depressive behavior in childhood is distinctly abnormal and psychiatric consultation is advisable.

Suicidal attempts in adolescents and young adults present considerable difficulty in diagnosis. Many gestures are superficial theatrical attempts to act out frustrations and resentment. A definite precipitating factor is common and the mental symptoms are temporary. A short hospitalization or counseling during outpatient interviews is often adequate. However, the patient should be kept in the hospital

## MEDICINE

### and the Biologic Sciences



if the depression lasts, since manic-depressive psychosis and schizophrenia often begin during adolescence.

With depression in old patients, suicide risks are real and should not be underestimated. Any of a variety of somatic symptoms may be the initial manifestations. Difficulty in sleeping, especially in the early morning, is characteristic and the patient usually requests sedatives. A disproportionate concern about some aspects of business or personal life is suggestive.

When depressive illness is suspected, questions must be asked about sleep habits, the outlook on the future, the usefulness of life, and thoughts of self-injury. One should stress the fact that treatment is available.

*Miller, Milton H.; Fellner, Carl H.; and Greenfield, Norman S.: Depression, Suicide and Suicidal Gesture in Medical Practice, Ann. Int. Med. 51:78-88 (July) 1959.*



### Rabies Prophylaxis

The breaking of the skin, as by a scratch or bite, is necessary to constitute exposure to rabies. A lick on

sound skin, even by a proved rabid animal, is not considered to be exposure to rabies. A lick on unbroken mucous membrane, however, or on abraded skin is considered to be an exposure.

Apparently, children are more susceptible to rabies than adults. Severe bites cause the disease oftener than superficial ones. Bites on the head or neck probably are more serious than those on the extremities. Wounds on exposed areas are more likely to become infected than those made through clothing. Previous vaccination of the animal does not guarantee protection against rabies.

Every bite should be assumed an exposure to rabies. The wound is flushed with soapy water or swabbed with 1:1,000 Zephiran chloride. With a puncture wound, fuming nitric acid should be applied. When rabies exposure is proved, part of the total dose of rabies antiserum is infiltrated locally, in amounts of 5 cubic centimeters.

After certain exposure, a combination of antiserum and vaccine is more effective than either alone in preventing rabies. The antiserum prolongs the incubation period and the vaccine produces an active immunity. Antiserum is administered in a single dose of 0.5 cubic centimeters per kilogram of body weight as soon as possible after exposure. At least 14 daily doses of vaccine must be given to obtain maximal effect.

Most vaccines contain a 20 per cent suspension of ground-up rabbit brain containing killed rabies virus. Sensitivity to the serum protein in the vaccine may produce urticaria, respiratory difficulty, fever, nausea, vomiting, or headache. Sensitivity to the brain tissue of the vaccine may result in encephalitis, with destructive demyelinating lesions in the central nervous system. Encephalitis occurs in approximately 1 of 3,000 persons after rabies vaccination and is fatal in about one-third.

Some persons, such as veterinarians, mailmen, and dog-catchers, who are frequently exposed to animal bites may be given a course of vaccine in advance. Vaccine is given in 3 doses

(Continued on page 292)

five days apart, with a booster dose one month later. One month after the booster, the subject's blood is tested for specific antibody response. If this is adequate, at subsequent exposure to rabies, 1 or 2 booster shots five days apart are sufficient to prevent disease.

*Habel, Karl: Prophylaxis for Rabies, Proc. Children's Hosp. 15:190-197 (August) 1959.*



### Nutritional Requirements of Athletes

The best diet for an athlete in training is essentially the same as for any healthy person. There are some variations which may increase efficiency of performance. Requirements of sports contestants depend upon the nutritional status of the participant, and intensity and duration of exercise.

The only accurate gauge of desirable weight is the composition of the individual body. Standard height-weight tables do not allow for the proportion of muscle weight in relation to fat weight. Specific gravity and subcutaneous fat measurements with special calipers at the beginning of training will indicate the appropriate caloric intake.

The cost of athletic activity in calories rises with intensity and length of exercise. Sufficient energy for brief, intense exertions is provided in well-balanced diets by creatine phosphate, adenosine triphosphate, and the anaerobic breakdown of glycogen to lactic acid.

The ingestion of meals containing a high proportion of carbohydrates may be advisable during training for events of long duration. Oxygen used to burn carbohydrates yields 10 per cent more calories than the same amount used to burn protein or fat. The increased efficiency may be decisive in an athletic contest. Some form of sugar that is readily metabolized may be used to supplement carbohydrate.

Protein needs are generally supplied by a well-balanced diet. Additional amounts are needed when the muscle mass is being increased by training.

The importance of vitamin, creatine, gelatin, or alkaline supplements has

not been established. Moderate salt intake is sufficient except in unusually hot weather when salt tablets are advisable.

Athletes require at least three meals daily. Five lighter meals may be preferred when training for protracted sport events. Breakfast is fundamental to efficiency, while the meal preceding a contest should be eaten three to four hours in advance to allow for ingestion and to lessen interference of emotional and nervous reactions with digestion.

*Bullen, Beverly; Mayer, Jean; and Stare, Frederick J.: Athletics and Nutrition, Am. J. Surg. 98:343-352 (April) 1959.*



### Carcinoma of the Gall-bladder

Primary carcinomas of the biliary tract occur mainly among persons over 50 years of age. About two-thirds of the tumors occur in the gall-bladder, the fundus being the commonest site.

More than half of persons with gall-bladder carcinoma are 60 to 69 years old and nearly three-fourths are women. About 60 per cent of the men and 90 per cent of the women have associated cholelithiasis. Almost all the growths are adenocarcinomas.

The most frequent symptom is pain in the right upper quadrant. Weight loss, nausea and vomiting, intolerance to food, and other gastrointestinal disturbances may also occur. Symptoms are of longer duration in patients with known cholelithiasis than in those without stones. In some patients carcinoma of the gall-bladder will mimic acute cholecystitis.

Examination often reveals a palpable tumor in the right upper quadrant and jaundice. Anemia, leukocytosis, and impaired liver function may be found. Symptoms and signs generally become more severe as carcinoma advances. Roentgenologic examination is of little value.

The gall-bladder and tumor are removed if possible. Right hepatic lobectomy may be advisable. Long-term survival after operation is rare. The first signs of recurrence are right upper quadrant pain, palpable mass in

the region of the right lobe of the liver, and back pain. Re-exploration often reveals a massive tumor in the right lobe of the liver but no distant metastasis. Removal of the right lobe at the time of the first laparotomy would therefore seem logical when carcinoma of the gall-bladder is resectable.

Gall-bladder cancer is not resected if the patient has distant metastasis or the tumor has spread to both lobes of the liver, the hepatic artery, the portal vein, or along the intrahepatic ducts. When the cancer is not removed, manifestations of liver failure from outflow obstruction of biliary secretions are generally dominant at the time of death.

Carcinoma of the gall-bladder is difficult to detect. Routine cholecystectomy is therefore recommended for patients with gallstones, whether or not cholelithiasis causes symptoms.

*Thorbjarnarson, Bjorn, and Glenn, Frank: Carcinoma of the Gallbladder, Cancer 12:1009-1015 (October) 1959.*



### Fingernail Growth

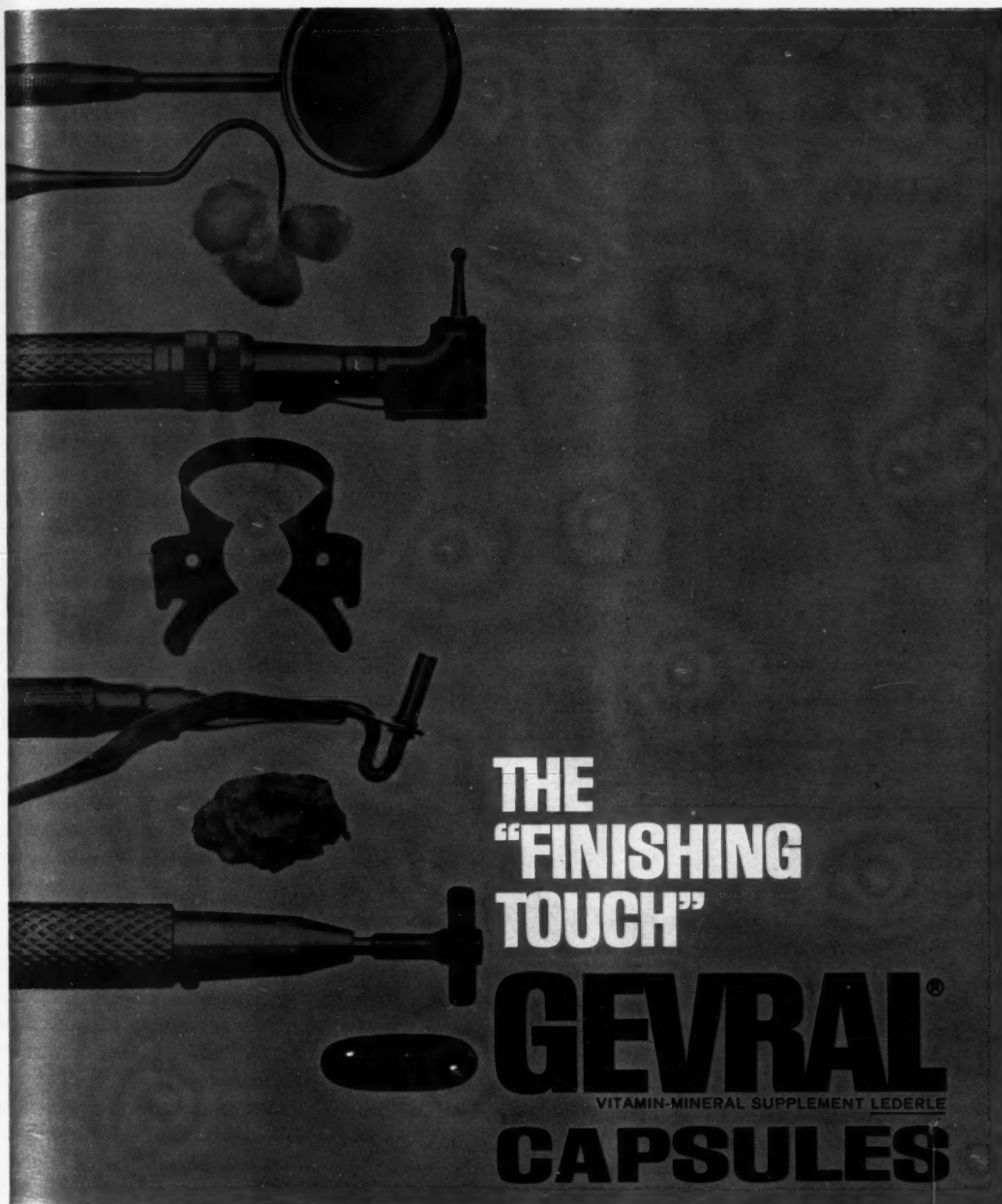
The rapidity of nail growth varies considerably among persons and the different nails of any given person grow at different rates. However, for any particular nail, the rate of growth is relatively constant throughout life.

The average daily nail growth is 0.104 to 0.108 millimeters per day for healthy men and 0.104 to 0.107 millimeters per day for women. The rate of growth per month varies from 1.9 to 4.4 millimeters.

Growth of fingernails is increased in nail biters and during pregnancy. Although not yet related specifically to menstrual cycles, transverse ridges corresponding to monthly growth arrests are demonstrable in some women.

The average rate of growth of the nail in the newborn infant is 0.112 millimeters per day. An initial arrest of growth producing a transverse ridge in the fingernails is seen in some infants. The nail growth of premature infants is about the same as for full-term infants.

(Continued on page 294)



Because nutritional deficiencies are now known to contribute to oral disorders, modern management techniques include comprehensive dietary supplementation. GEVRAL Capsules provide the "finishing touch" to your therapy. Your patients will get more than the minimum daily requirement of essential vitamins and minerals on a dosage of only one dry-filled capsule per day.

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 Calcium (as CaHPO<sub>4</sub>) . . . . . 145 mg.  
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 Copper (as CuO) . . . . . 1 mg.  
 Fluorine (as CaF<sub>2</sub>) . . . . . 0.1 mg.  
 Manganese (as MnO<sub>2</sub>) . . . . . 1 mg.  
 Magnesium (as MgO) . . . . . 1 mg.  
 Potassium (as K<sub>2</sub>SO<sub>4</sub>) . . . . . 5 mg.  
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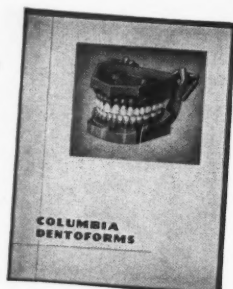




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or you can say it with pic-  
tures, but it's best to say  
it with . . .

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Paralysis or immobilization of a limb, chronic disease, and malnutrition slow the rate of growth of nails. Omission of a single amino acid from the diet does not impair nail growth though weight gain is diminished or ceases. Reducing diets do not affect nail growth appreciably.

Acute infections have variable effects on the rate of nail growth. Measles arrest nail growth for variable periods. Retardation of nail growth sometimes accompanies the common cold, the febrile period of mumps, and septicemia severe enough to cause weight loss. Tuberculosis and sarcoidosis do not affect the nail growth.

An extraordinarily slow rate of growth is seen in nephrotic patients. Narrow, transverse lines have been observed in the nails of hypoalbuminemic patients. Anemia may produce koilonychia.

*Sibinga, Maarten S.: Observations on Growth of Fingernails in Health and Disease, Pediatrics 24:225-233 (August) 1959.*

## Contra- Angles



### Country Squire or Commercial Farmer

A FRIEND of mine who practices dentistry in a small town owns a farm. He told me recently of the city dentist who wanted to buy a farm. My friend asked the city fellow: "Were you born on a farm? Have you ever lived on a farm? Do you know anything about the business of farming?"

The reply to all questions was negative.

Rather than switch on an oration on the perils and precarious nature of the agrarian life my friend confided to the city dentist:

"I have some old dental equipment I think I'll advertise for sale to some farmer."

The city dentist was confused and indignant: "You can't do that. A farmer doesn't know anything about dentistry."

"That's right," said my friend. "The farmer knows as much about dentistry as you do about farming."

The city dentist has decided to place his surplus cash in other investments.

Farming is more complicated than it was in the days of our grandfathers. There is more to this vocation than dropping seeds in the ground and watching them grow into a profitable crop. There is more to it than buying a few head of cattle and a few hundred chickens and sitting back to garner the profits from the work of the animals or poultry. Living things require constant—and expensive—care. Farming is now big business that requires technical and expert knowledge and large outlays for machinery and equipment. The subsistence farm, the "Five Acres and Independence" themes are romantic myths.

It is pleasant to live in the country. I have done it part time for years. (We

have tried and forsaken the chicken-raising gambit.) At one time the pace in the country was slower than it is now and living costs were substantially less. That has changed. The traffic on the country roads is now almost as heavy and as dangerous as it is on city streets. Subdivisions, trailer camps, automobile junk yards are invading the countryside in many places. The cost of living is about the same as it is in the city: food prices are virtually the same; automobile expenses the same; service charges and upkeep the same. The country, overall, may be slightly less expensive than the city because there are fewer places to spend money. The dream of idyllic independence in country living cannot be fulfilled.

The dentist who is a stranger to the rural life and mores, or the one who expects to be an absentee farmer, will do better to put his money in other business ventures. If he wishes to live in the country he is better off if he buys a small piece of land without thought of putting it to productive use for profit. It is better for most dentists (and cheaper) to play country squire than to try to be a commercial farmer.

### Birth Gifts

Atherosclerosis and the diseases of the circulatory system that are associated with this degenerative condition are under constant scientific scrutiny. So far little precise information has been uncovered.

One suggestion has been made by Howard B. Sprague, M.D. of Harvard that each neonate should be given:

"A toy to chew on, made of Rauwolfia, to prevent hypertension; bathroom scales so he can check his daily weight; a do-it-yourself serum cholesterol kit; a life membership in Alcoholics Anonymous; a negative credit card to prevent overeating; a perpetually refillable prescription for tranquilizers and anticoagulants; a bicycle to ensure exercise."

At our present level of knowledge on atherosclerosis, which is not extensive, it is believed that keeping the weight, serum cholesterol, and blood pressure down will retard the formation of plaques inside blood vessel

walls. Moderate and regular exercise stimulates the coronary circulation and speeds up the metabolic breakdown of fats.

Doctor Sprague is undoubtedly correct in his insistence that proper habits to ensure health must begin early.

### Dentists on Strike!

We have never seen a sign proclaiming that dentists are on strike. We hope we never will. It is a shock, therefore, to read that more than 50,000 dentists and physicians in Japan went on a one-day strike to gain increased fees under the government health insurance system.

Here is the story from *Medical Tribune*:

"More than half of the 100,000 members of the Japanese medical and dental associations staged a nationwide Sunday strike to emphasize their demands for a 30 per cent increase in fees under the Government health insurance program. The Government has offered 10 per cent.

"While an estimated 55,000 physicians and dentists left their offices to attend parades and rallies, another 8,500 were reported on duty to attend emergency cases."

Dentists and physicians have the right to bargain with any agency to gain their economic rights. If they are working in a government system they have the right to negotiate with all the vigor they can muster to have inequities corrected. There is *never* an excuse for them to go on strike against the public welfare. That is anarchy.

### Dental Affairs in Space Travel

When Commander Alan B. Shepard became our first astronaut it was the beginning of more and longer explorations into space. When our space vehicles take off to place a man in orbit around the earth or toward the moon the problem of supplying the astronauts with food must be considered.

Dentists who are particularly concerned with the mechanisms of chewing and swallowing will be interested to know that these subjects have been carefully considered by our space researchers.

(Continued on page 299)

## NEUTROX BETWEEN OFFICE VISITS SPEEDS RECOVERY OF YOUR GINGIVAL PATIENTS



Doctor,  
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wonders.  
My gums  
look and feel  
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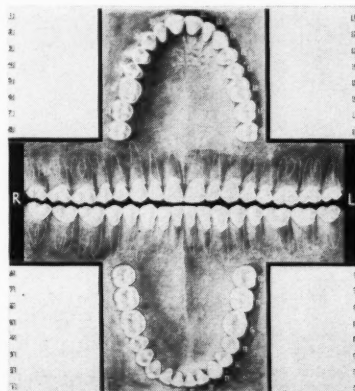
(*In vitro* studies prove Neutrox kills 8 million fusiform bacilli in less than 60 seconds<sup>1</sup> . . . kills more than 18 billion spirochetes in less than 30 seconds<sup>2</sup>.)



For Professional Sample write:

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- 1 Report on Neutrox from the Journal of American Pharmaceutical Association, Vol. 36, p. 385, Dec. 1947.
- 2 Report on Neutrox from the Journal of American Pharmaceutical Association, Vol. 38, p. 258, May 1949.



### Permanent Records Are Important . . .

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Here is \$1.50 for a pad of 50 Ryan Examination and Treatment Record Charts.

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Address \_\_\_\_\_  
City \_\_\_\_\_

## tool of research

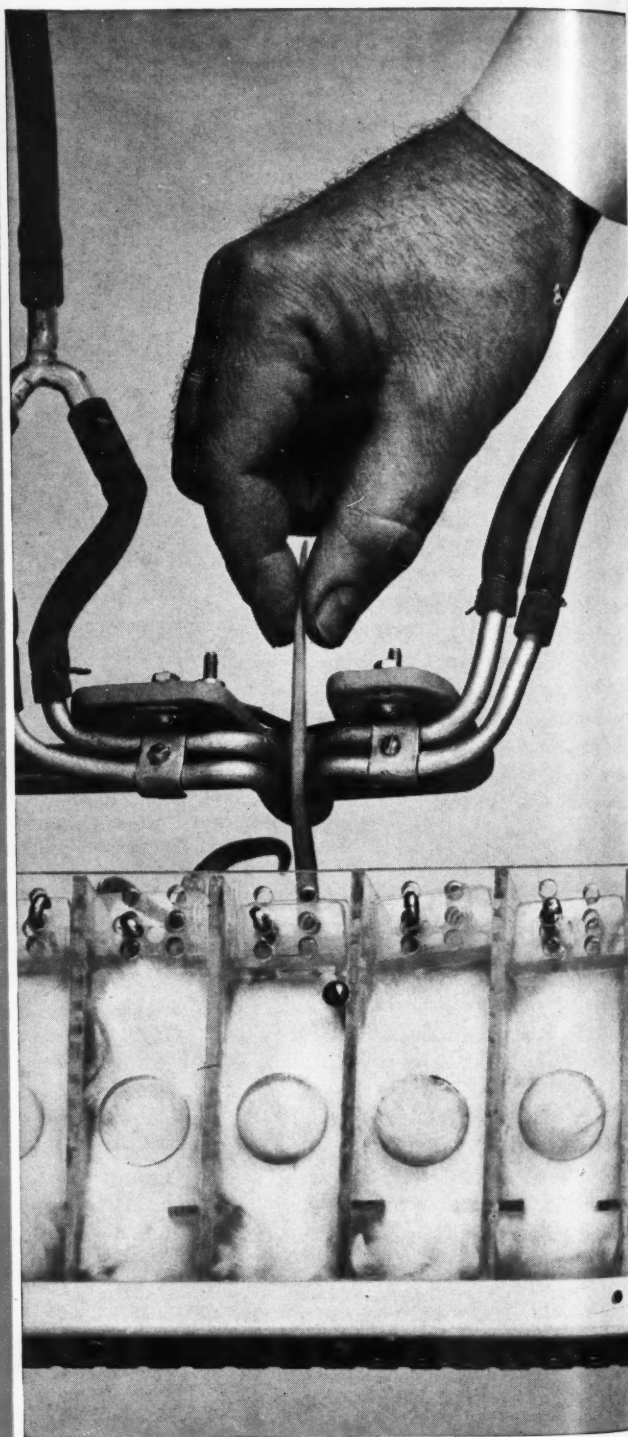
### RATTAIL HEAT TECHNIC

Twenty rats, in groups of four, are used in this modification of the method described by Davies *et al.*<sup>1</sup> The pain stimulus is provided by a heated resistance wire placed near the rats' tails. Direct contact with the hot wire is prevented by a specially designed water-cooled tail rest. Observers record the time interval that animals take to respond (tail jerk) to the heat stimulus.

Untreated rats react within three to six seconds. Any prolongation of this reaction time in animals receiving test medication is an indication of analgesia.

The rattail heat technic is one of many tests used by Lilly scientists to study the analgesic properties of compounds such as Darvon®. This unique analgesic, discovered and synthesized in the Lilly Research Laboratories, is equal to codeine in analgesic action yet has fewer side-effects.

1. Davies, O. L., Raventos, J., and Walpole, A. L.: *Brit. J. Pharmacol.*, **1**:255, 1946.  
Darvon® (dextro propoxyphene hydrochloride, Lilly)



*Rattail Heat Technic . . . valuable in preliminary screening of drugs for analgesic activity. Specially designed water-cooled tail rest prevents direct contact with hot wire.*





**Leonard M. Monheim**  
B.S., M.S., D.D.S.

Professor and Head of Department of Anesthesia, University of Pittsburgh School of Dentistry, Pittsburgh, Pa.; Assistant Professor, Department of Surgery (Anesthesia), University of Pittsburgh School of Medicine; Professor, Graduate School (Dentistry), University of Pittsburgh.

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only book which thoroughly discusses preanesthetic evaluation, the choice of anesthetics and preanesthetic and postanesthetic medications. The new 2nd edition of this book can give you valuable clinical advice on the most widely used injection techniques; it discusses drug and injection complications and shows you how to recognize, prevent and treat them. The pharmacology of drugs is more thoroughly explained in this new edition.

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search scientists. A report on the subject by Lieutenant Albert A. Taylor USAF appeared in the *Journal of Applied Nutrition*:

"How will the astronaut eat?

"These are questions of a practical nature. The answer to how the astronaut will eat is a comparatively simple one. The cabin environment will be such as to permit easy access to the mouth for eating and drinking except during the period of launch and during re-entry into the earth's atmosphere. However, weightlessness, in conjunction with many necessary protective measures will make the conventional handling and eating of food somewhat difficult and awkward. Eating from a plate with knife, fork, and spoon will certainly not be possible. Under normal weightful conditions, foods and liquids can be consumed without difficulty. However, if we are in a spaceship in a state of weightlessness, and indulge in our ordinary habits of eating and drinking, a number of interesting phenomena will result. If a piece of meat happens to slip while

being cut, it will fly off the plate and splatter against the wall. From there it will bounce back, and if we are fairly agile we might grab it as it flies past. Otherwise, it will continue to bounce back and forth off the walls, ceiling, and floor in a three-dimensional billiard game. A fork full of peas raised to the mouth will continue in its upward flight to the ceiling and be reflected back to bombard like buckshot. A cup of coffee raised to the mouth will result in the unhappy victim receiving the entire contents in his face. To avoid such frustrating experiences, it is necessary to confine food and liquids in containers from which they can be squeezed or squirted into the mouth. In lieu of the usual utensils, liquids and semi-solids can easily be served from collapsible squeeze tubes. Solids in bite-size form can be removed by hand from a covered container and placed directly into the mouth.

"From our limited knowledge to date no real problems involving the chewing or swallowing of food in a weightless state are anticipated. Actu-

ally, however, we are in no position to judge man's ability to eat and digest food under prolonged conditions of weightlessness. At present, we can simulate weightlessness for only about a minute at a time by flying an aircraft in a parabolic flight path such that centrifugal force just equals the pull of gravity. This is hardly long enough to gather valid information concerning the mechanics of eating, ease of digestion and absorption, or nutritional requirements. During prolonged weightlessness, it is conceivable that man's energy requirements will decrease considerably since he will not be combating the pull of gravity as he does on earth. In addition, his exercise may be severely limited during very long periods of travel in space...

"The details of supplying nutritional support to space voyagers engaged in flights of short duration will be extensions of feeding practices currently used in high-performance, high-altitude aircraft. However, for longer space flights new concepts are needed.

*(Continued on page 301)*

# THREE NEW WAYS TO HELP YOUR PRACTICE KEEP PACE WITH PROFESSIONAL PROGRESS

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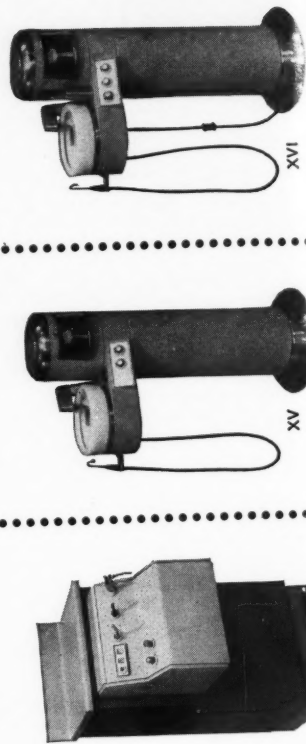
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Space travel involving periods of time as long as several months will require the use of dehydrated and concentrated foods and the reprocessing of water and oxygen. Flights of still longer duration will, in addition, necessitate the production of food during flight. For these very long flights, a closed and balanced ecological system which can support life and supply man's needs must be developed."

Dental science is, more and more, penetrating into all areas of life and action. We will soon have another subject before us: a research project on the function of the dental system in the weightless state of space travel.

—E.J.R.

## Erratic Evolution of Orthodontics

ALLAN G. BRODIE, D.D.S., Ph.D., Chicago

### Six-Year Study of Orthodontic Results

In 1938 the staff of the orthodontic department of the University of Illinois published the results of a six-year study entitled "A Cephalometric Appraisal of Orthodontic Results." The sample was divided according to the Angle classification and included all cases treated during the previous six years. Obviously, many of the finished records were those taken at the end of treatment. The findings were sobering because they showed, to our satisfaction at least, that we were doing some things that we did not suspect and failing to do much that we had thought we were accomplishing.

### Concept Challenged

The finding that the establishment of excellent occlusal relations was not necessarily accompanied by changes in associated bone structures, as the concept of functional development had led us to expect, forced us to abandon this concept. But this finding had even greater effects on others in the field of orthodontics. In some quarters it was seized upon as an explanation for relapse. It was reasoned that if function would not develop sufficient bone to hold all the teeth, there was no re-

course but the extraction of sufficient tooth material to make them harmonize with the jaws that held them.

**Successful Treatment Explained—** If the concept of functional development was no longer tenable, however, it was obvious, to some at least, that those cases that had been treated successfully in the past had also to be explained. There were many such cases in the practices of experienced orthodontists. The answer lay before us revealed by our cephalometric x-rays: it was the amount of growth and the

degree of maturation enjoyed by the individual patient.

**Interpretations Differ—** Without the benefit of headplates, which were being taken by few practitioners at that time, conclusions could be based only upon evidence derived from plaster models and photographs. These seemed to point, in many cases, to a lack of sufficient bone to hold all the teeth. Arches were expanded, teeth were tipped excessively, and lips were prominent. All signs pointed to the ne-

(Continued on page 302)



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## CLINICAL AND LABORATORY SUGGESTIONS

(See pages 288 and 289)

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708 Church Street  
Evanston, Illinois

From: \_\_\_\_\_

Subject \_\_\_\_\_

Explanation of Procedure:

Sketch:

Suggestions submitted cannot be acknowledged or returned.

\$10 will be paid on publication for each suggestion that is used.

cessity of extracting teeth if they were to be in harmony with surrounding parts, and this procedure was endorsed, tentatively at first and then with overwhelming enthusiasm.

**Rationalization Cited**—Once the propriety of this mode of treatment was accepted, new concepts followed

each other in rapid succession. Without exception, each of these was a rationalization, unsupported by any objective evidence. The following are a few of these rationalizations:

1. The jaws of modern man are undergoing a diminution in size to a greater extent than are the teeth.

2. Teeth should stand upright over the ridge of so-called basal bone. (This was borrowed directly from full denture prosthesis. In the natural dentition there is no ridge and the axial inclination of the teeth in normal, untreated occlusions has a range of over 20 degrees. The mean of the range depends upon which plane of reference is used in the particular study.)

3. When teeth stand upright over basal bone, they are more stable because forces then travel down their axes. (It is difficult to see how incisors can transmit forces down their axes unless they meet edge to edge. Actually, the incisors transmit less force down their axes than any other teeth, since they pass each other, scissors-fashion, in function.)

4. Since the incisors should stand upright over basal bone, the profile of the face should be straight.

5. The face with the straight profile is the most beautiful.

6. Failure to obtain a straight profile with treatment constitutes failure to obtain the objectives of treatment.

**Violation of Basic Concepts**—These last three precepts violate fundamental canons of both art and biology, namely, that there are endless forms of beauty and that there is infinite variation in all forms of life. Were this not so, there could be no evolution.

### Changes in Orthodontic Objective

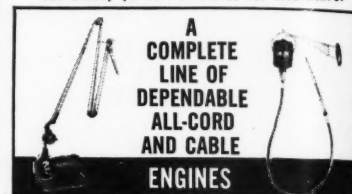
Through rationalizations such as these and others, the basic concepts governing a large proportion of orthodontic practice in this country have changed radically during the past twenty-five years. Esthetics of the face has supplanted function of the teeth as the chief objective of orthodontic treatment, tending to place the orthodontist in a class with the beautician rather than with the "physicians of the mouth."

**Prestige Threatened**—This over-



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zealous concern with esthetics and speed at the expense of all else is threatening the prestige of orthodontics, which has long been looked upon as the most scientific of dental fields. Parents and dentists alike are questioning the propriety of extracting so many teeth in the attempt to establish adult relations in a child's face.

**Problems Posed by Present Concepts**—Aside from the question of prestige, the dental health of our patients is another important consideration. The premature aging of the denture that seems characteristic of cases treated by extraction mainly for the purpose of straightening the profile, the deepening of overbites with the not infrequent appearance of joint symptoms, and the development of spaces at the sites of extractions all bear witness to the fact that we have not yet reached Utopia. Are present concepts helping us to get there or carrying us farther away?

Adapted from *American Journal of Orthodontics* 47:121 (February) 1961.